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The IRON AGE

Vol. 161, No. 13 March 25, 1948

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Features

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News and Markets

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"Let's Nationalize"

"WE ought to nationalize the oil industry." The speaker was an elderly, active, successful businessman of the rugged individual type. He had always voted Republican and looked forward to the election of a Republican candidate this fall. The scene was a luncheon at the India House in downtown New York. The guests were a banker and a couple of business associates. The speaker was not a rabble-rouser; his audience was not a group of frustrated left-wingers. The scene was not a soap box in Union Square.

It seems that this man had had trouble getting fuel oil for his home. It cost him much more than it did last year. He had noted two recent successive increases in the price of crude. Also noted and caustically commented on were the reports of the oil companies showing unprecedented earnings. They "were making too much money." The consumers were being "robbed."

Here is a state of mind which is shocking in its implications. It is proposed to hand an industry over to the state because oil is scarce and the companies seem to be making too much money. It is shocking because a man who is one of its beneficiaries and should be one of its stoutest supporters expects of capitalism a perfection which he should certainly know no other system offers.

Capitalism has faults — many of them aggravating, odious faults. The very motive power of capitalism — the avarice of the individual — is distinctly unlovely. The tolerant and wise will know that any other system will likewise reveal faults — not the same, perhaps, but in all likelihood far more serious in terms of human freedom and progress.

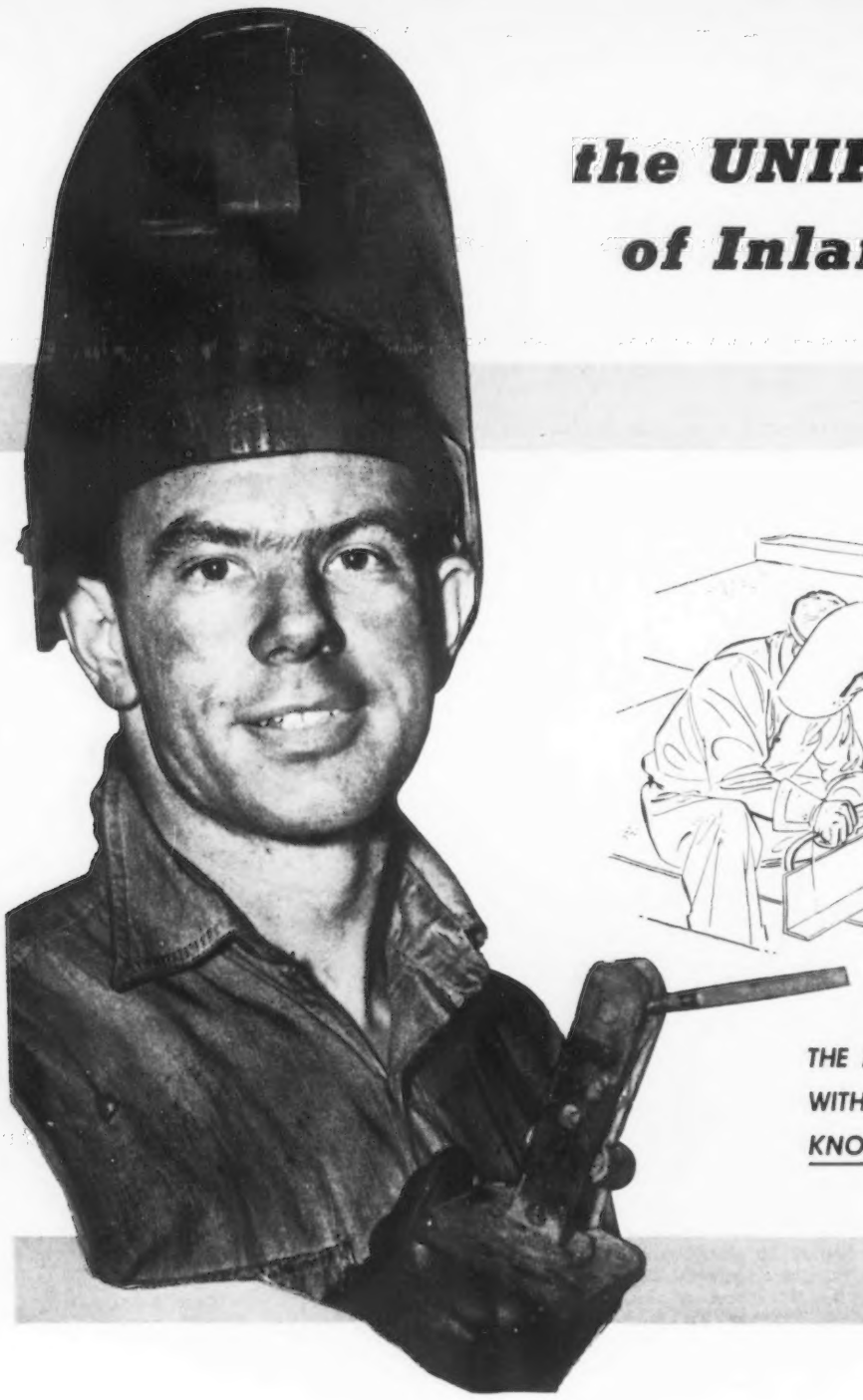
The evidence does not support the charge that the oil industry has abused its position and that government ownership would correct high prices — assuming that high prices in the premises are a fault. Oil is high because there is not enough of it to go around — at current prices. It is not scarce absolutely. The world is producing more oil now than it ever has. The scarcity is relative and is due to the enormous demand. This demand is a free choice. No one is compelled to buy oil. The man who pays for it is buying it because it represents more value to him than the money he gives in return. In relation to other prices, gasoline is still cheap. It is cheaper now than it was 25 years ago.

A rise in price will discourage some consumption. This is the automatic free rationing which an open market price imposes. Does the buyer want his purchases limited by a ration coupon issued by the government under the direction of a bureaucratic commissar? Or would he prefer to regulate his own consumption in response to the pressure of price?

If there is not enough oil to go around, what will increase the supply? Will nationalization? Where on earth has the state, seizing control of industry, improved efficiency and raised output? An added 50 cents a barrel will send thousands of wild-catters out to sink new holes and risk their capital on the possible discovery of new oil. It brings nearer exploitation of substitute sources of liquid fuel. This is the tested, classic method of bringing supply and demand into balance. It does this under conditions of free personal choice, without limiting liberties or curtailing incentives. This is a basic verity and a businessman should be the last one to forget it.

Joseph Stagg Lawrence

"I like the UNIFORMITY of Inland Steel"



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► Many standard machine tool producers are practically living off contract work. Proposals for new machines are in good volume, but few such proposals are being converted into orders. Machine tool manufacturers point out that considerable engineering expense is involved in handling such proposals and the only way that expense can be retrieved is by selling machine tools. Consequently, there is felt to be a need for charging engineering fees on such proposals, especially if they do not result in orders.

► Foundries on the West Coast and in New England are paying what are believed to be all-time record prices for pig iron. Coming from Texas, it delivers at $91 and $95 respectively at those points.

► The Italian steel industry has contracted for gradually increasing shipments of Algerian iron ore during the next 3 years. Italy is to furnish the equipment for development of the mines.

► One of the smaller steel producers is reported cutting customers plate quotas with the idea of diverting some tonnage to pipe fabrication.

► Some producers of iron powders have brought to the attention of government officials the dependance of domestic iron powder parts makers on Swedish raw material which might be cut off in the event of war. It is recognized by the industry that the volume of imports of Swedish iron powder sold here at a low price threatens the strength of the domestic powder producing industry.

► Washington circles are talking about rationing soda ash, vital ingredient in glass making, and also used in desulfurizing pig iron.

► A magnetic chuck has been developed that has two magnetic faces positioned at right angles to each other and both have full magnetic power to the point of face intersection. A knife manufacturer has the only one thus far built, which measures 8x8x120 in.

► Allis Chalmers is taking a major part in the development of a 4100-hp coal burning gas turbine locomotive scheduled for tests early in 1949.

► Up to a quarter of the wire drawing capacity in the United Kingdom is idle due to a shortage of raw material. Rod supplies are being increased, but they are still far short of demand. New rod making capacity in Britain will not be useful until 1950.

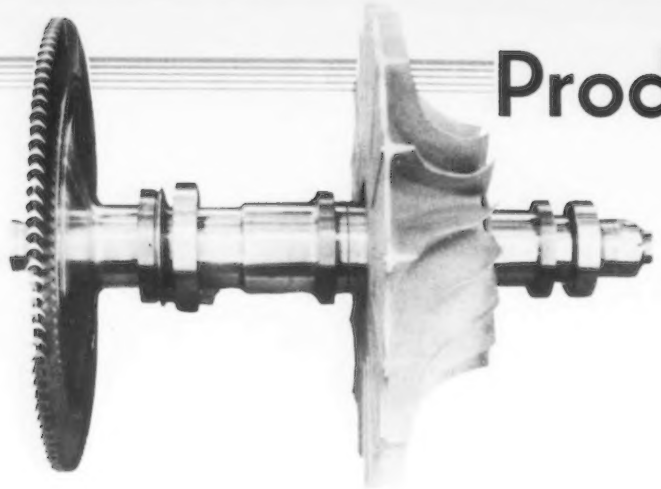
► Increased weight of automobiles has not been accompanied by an increase in strength or rigidity. For this reason, some auto engineers argue that a lighter structure should be designed with improved rigidity-to-weight ratio, thereby effecting a savings for both manufacturer and user.

► Considerable interest has resulted in studies of injuries to ground surfaces of hard materials such as tool and die steels, carburized and hardened steels and tungsten carbides. In addition to a recent report on this problem by a grinding wheel manufacturer, an association has sponsored a fellowship at Mellon Institute for such research.

► Machine stitching of sheet metal products has been perfected to the point that the seams can be made air and water tight.

► Sweden has negotiated the purchase of one of the blast furnaces at the Herman Goering Werke at Linz, Austria, to be moved to the new government works being built at the far north Lulea site.

► A group of car dealers in Pittsburgh permits the customer after depositing $200 to cover finance and insurance costs to rent a new car at $100 a month for 6 months. If the customer decides to buy the car, the $600 is credited against the selling price.



Producing Diesel

By F. R. ERICSON

Auxiliary Turbine Engineering Div.,
General Electric Co.,
Fitchburg, Mass.

FIG. 1—The heart of the turbosupercharger, this rotor shows the various components. At left is the wheel, which is flash welded to the shaft, and to which the buckets are arcwelded. The impeller, at right, is aluminum, machined from a finger forging with the blades bent to shape after annealing.

THE power output of a diesel engine may be increased from 80 to 100 pct over its natural asperated rating by boosting the intake air pressure to a gage level of 18 to 20 psi. This can be accomplished by the application of a turbosupercharger weighing less than 3 pct of the weight of the engine, in sizes ranging from 1500 to 2000 hp. These engines have operated at altitudes of 10,000 ft without loss of power and when installed in a three unit 6000-hp locomotive pulling an 1100-ton train have negotiated a 3½ pct grade without the use of a helper.

The turbosupercharger is not mechanically connected to the engine controls. It receives engine exhaust gases at approximately 1200°F and converts the available energy in this gas into power to drive a centrifugal compressor through the medium of a gas turbine. The compressor takes filtered air at ambient pressures and temperatures, boosts it to 18 to 20 lb gage, and delivers it to the intake manifold of the engine. The supercharger operates in a closed thermal cycle with the engine. Without intervening controls or valves between the engine and the supercharger, its operation is entirely dependent on the engine.

The rotor of the supercharger, shown in fig. 1, having mass and friction, will necessarily lag behind the engine operation in transient conditions. This lag must be kept to a minimum to in-

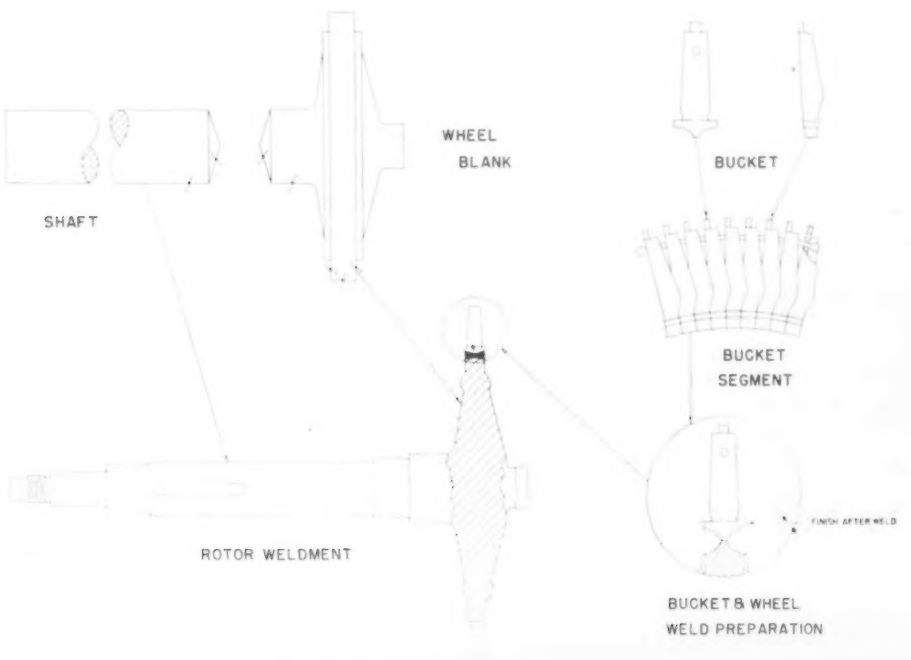


FIG. 2—These are the turbine rotor components. The rotor is made up of a single weldment, with the shaft flash welded to the wheel blank and the buckets arcwelded to the rim of the wheel.

Engine Turbosuperchargers

The production of components of turbosuperchargers for railroad diesel engines and the assembly of turbine buckets to the wheel are described in this article. This step-by-step description of the fixturing and welding of the turbine parts, including the buckets of high temperature alloys, shows the accuracy to which welded fabrications can be held. The milling operations in producing the buckets from solid bar stock are detailed.

sure a sufficient air supply for good combustion, especially during acceleration. Poor combustion, outside of loss of power, produces a smoky exhaust which is not only objectionable but is a civic misdemeanor in many communities. This condition is especially true on switcher locomotives that seldom operate at a steady state condition and seldom leave a metropolitan area.

To meet these conditions, a design employing proved economical manufacturing processes has been worked out. Many processes and techniques developed and proved in the aircraft gas turbine division of General Electric Co. during the war were utilized in the design of the diesel application. Modifications and refinements were made to meet improved efficiencies and longer life. The design life of a supercharger for nonaircraft application is approximately 100 times that required for aircraft applications.

The unit consists of a gas turbine driving a centrifugal compressor with the turbine wheel and compressor impeller on a common shaft operating from a full load speed of approximately 15,000 rpm at sea level to approximately 18,000 rpm at altitude. One of the most interesting problems and manufacturing processes involved is in the turbine rotor.

As pointed out, the supercharger lag behind the engine during acceleration must be kept at a minimum. It was therefore imperative to select operating speeds, materials, and processes that would result in a minimum of rotating mass with a maximum factor of safety and design life.

Mechanical attachments of the shaft and buckets require flanges and rims of such a size that they add materially to the mass. By making this item up as a single weldment, that is, flash welding the shaft to wheel blank and then arc-welding the buckets to its rim, the material used and consequent mass is reduced to a minimum. These components are shown in fig. 2.

In the manufacturing process the shaft made from a heat-treated alloyed steel is rough turned and a conical tip weld preparation is machined on

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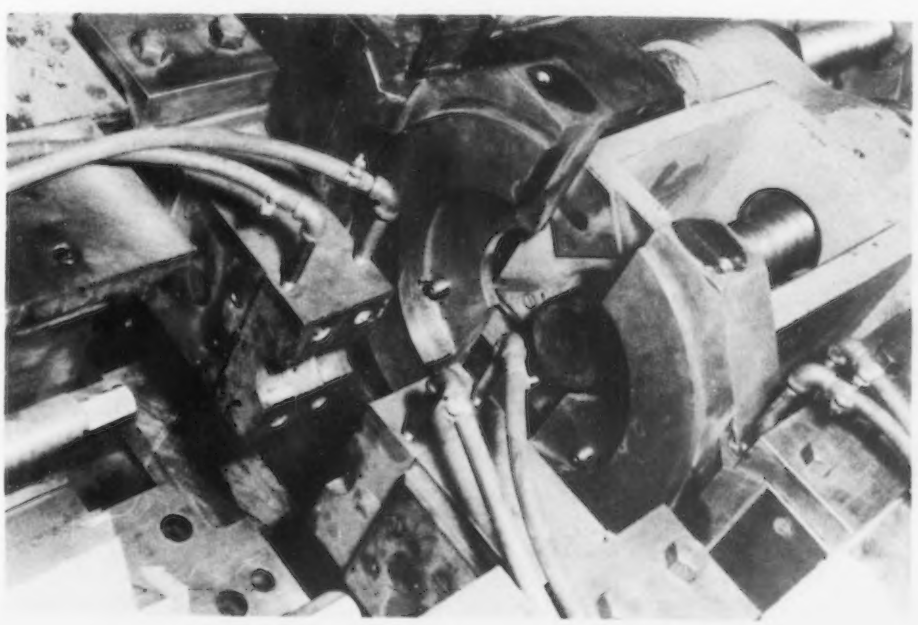

FIG. 3—This 800-kva flash welder welds the turbine shaft to the wheel. The upset current is 58,500 amp and the upset pressure is 240,000 lb.

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FIG. 4—Turbine buckets are milled from heat treated 16-25-6 high temperature steel bar stock. These are the milling and finishing steps.

one end. It is then Magnaflux inspected for cracks and flaws.

The wheel blank, made from the 16-25-6 high temperature alloy, is drop forged, turned on the hub diameter and faced on the hub end to a conical tip weld preparation. The rim is turned and faced to fit the holding jaws on the flash welding machine. The blank is then Zyglo inspected for cracks and flaws. The wheel and the blank are then gripped in the hydraulically operated jaws of an 800 kva flash welder, shown in fig. 3, with a clamping force of 14 tons. The jaws also form the electrical connection to their respective parts. The two parts are then flash welded together with an upset current of 58,500 amp and an upset force 240,000 lb. In welding the combined loss of material on the two parts is approximately 2½ in. in length.

The resulting assembly is then strain relief annealed after which the weld area is turned to a good surface and both Magnaflux and Zyglo inspected for flaws. The weldment is then rough turned and the rim of the wheel is turned for welding on the buckets.

While several processes, such as precision castings by the lost wax method, pressure casting, forgings and pressings, have been developed to produce buckets from high temperature materials, because of production conditions and manufacturing facilities, the buckets are milled from solid stock for these units.

In the solid milled bucket, shown in fig. 4, the material, 16-25-6 alloy, is received in bar stock, heat treated to proper specifications at its source. After the bars are cut to length, fig. 4A, the weld preparation, including a portion of the sides and tenon end, is milled in gangs on a two spindle miller with a set of gang cutters on each spindle. The tenon and the sides of the base thus milled are used for locating points on the fixtures for future operations. The sides, fig. 4B, are then slab milled in gangs on a horizontal miller and then the scoop, fig. 4C, is plunge milled. Because of the stringy nature of the chips formed and because the cutter design tapers toward the shank allowing but very little clearance for chips to escape, this operation is performed on one bucket at a time.

In the next operation, fig. 4D, the scoop, formed on the previous operation, and the base are used as locaters for milling the back contour of the bucket. As this surface consists of a radius joining on two straight sides with a simple radius at the base, a tapered end mill is employed with a fixture mounted on a circular table.

Again locating on the scoop and sides of the base, the width of the tenon is milled and the base is milled for thickness and taper, fig. 4E. Close tolerances must be held here because the thickness and taper of base as well as its relative position to the tenon determines the relative location of the bucket and wheel in the welding fixture. The relation of these elements to the scoop is also vital in the prevention of bending couples which would overstress the bucket edges at high speed.

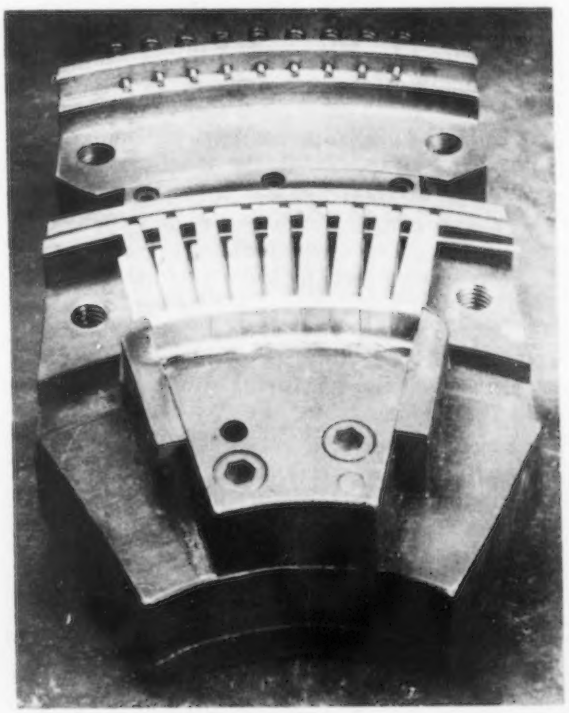

FIG. 5—The initial step in assembling the buckets is to make up six segments of nine buckets each. This fixture holds the buckets in place for welding. The cover in the background is clamped on and the bucket bases are welded together by the atomic hydrogen process.

To meet the accuracy required to produce a bucket capable of withstanding high speed at elevated temperatures, constant inspection employing special gaging equipment is required on all operations.

After the edges are trimmed, the blade hole drilled, the blade section polished, fig. 4F, and finally inspected, the buckets are given an electrolytic etch in a weak acid solution and visually inspected for surface flaws. The buckets are then

ready for welding to the wheel. While this machining process seems long and laborious, tooling and motion study have made costs on this method competitive with the other processes.

The initial step in assembling buckets to the wheel is to make up six segments of nine buckets, as shown in fig. 2. In making up these segments, the buckets are placed in a fixture shown in fig. 5. The base is made to simulate the rim of the wheel with radial abutments properly spaced. The buckets are selected to fit snugly between these abutments with the tenons at the tip fitting into the slots provided in the fixture. During this operation, a dampening wire is inserted through the buckets. The cover in the background of fig. 5 is then clamped in place and the buckets are held against the base by set screws shown in the cover. The buckets are then welded together by the atomic hydrogen process.

Six of these segments are then evenly spaced about the periphery of the wheel in a welding fixture, such as that shown in fig. 6, and positioned radially by the bucket tenons in the slots provided in a manner similar to that used in the segment fixture. The spaces between these segments are filled with unwelded buckets selected so that the accumulated space between the buckets in any one section will not exceed 0.002 in. After the buckets have been selected they are removed and the dampening wire inserted. The ends of the wire in these segments as well as in the welded master segments are fused to prevent pulling out.

As to the reason for the dampening wires, the rotor operates over a wide range of speeds, and a correspondingly wide range of frequencies is excited. The buckets passing the nozzle blades may be one cause of this condition. Due to design limitations, it is impossible to design a bucket that does not have a resonant frequency within this range. Unless the energy thus imparted to the bucket is removed or absorbed, the magnitude of the induced vibration will be such as to produce fatigue failure. The function of the wire, which has a loose fit in the holes provided in each bucket, is to absorb this energy in the form of frictional heat and keep the amplitude of vibration within safe limits.

After the buckets have been reassembled in the fixture as shown in fig. 7 it is closed, clamping the buckets axially at the base and closing the fourth side of the tenon slot. While the tenon positions the tip of the bucket radially and axially, it is free to move to and from the wheel to allow for first expansion and then shrinkage during the welding cycle. With the fixture closed, the U weld preparation formed by the bucket bases and wheel is exposed for welding except where the clamps span the groove to hold the wheel in position. The bucket ring is then tack welded to the wheel so that the clamps holding the wheel can be removed and expose the entire groove. Four passes of type 316 stainless steel electrode wire are deposited on each side of the wheel by electric arcwelding. The fixture is mounted on a trunnion in order that these passes may be deposited alternately with the first, third, fifth, and seventh, on one side and the even numbered passes on the other. This procedure balances the welding strains on both sides of the bucket base and minimizes distortion.

Between each pass the weld is cleaned, inspected and all cracks or defects removed. The completed weldment is then stress relief annealed, the weld surface machined, leaving stock for finish machining, X-rayed and examined for slag and

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FIG. 6—Six welded segments are placed around the periphery of the turbine wheel in a welding fixture and positioned in a manner similar to the positioning in the segment fixture.

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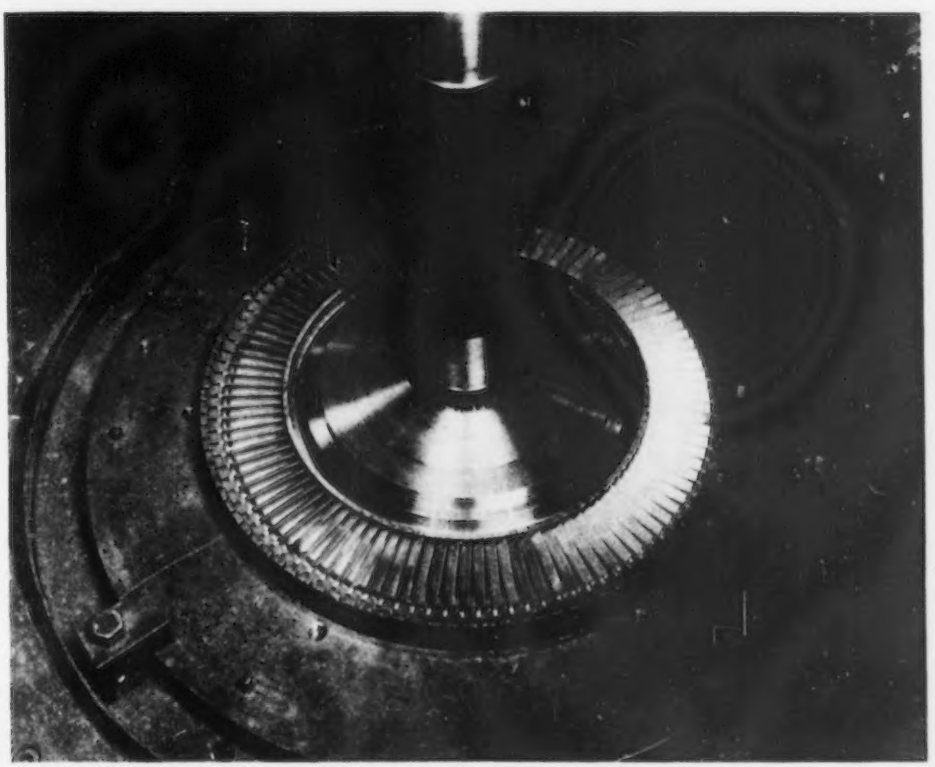

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FIG. 7—When clamped, a multiple welding pass technique is employed to join the bucket segments to the turbine wheel. Deviations of more than ½° out of the design plane cause rejection of the weldment.

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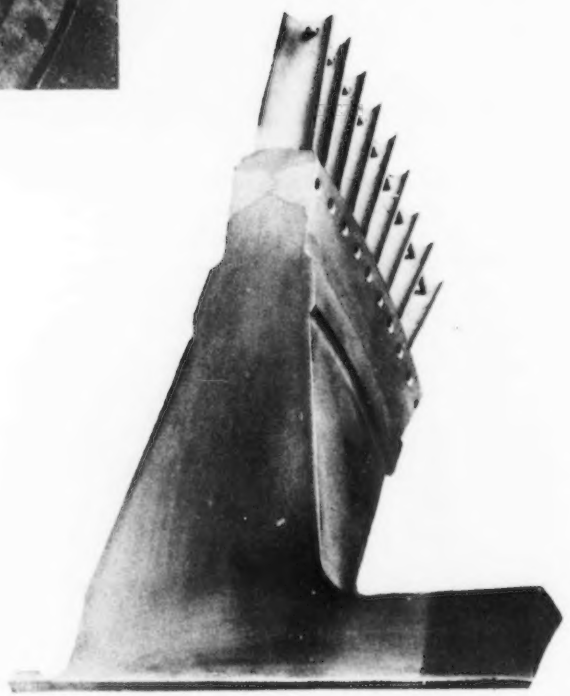
BELOW

FIG. 8—This etched section shows the location of the crack arrestor holes and the position of the weld joining the bucket to the turbine wheel.



cracks. Minor surface cracks and inclusions may be accepted if they can be ground out. However, any slag or cracks in the weld zone cause rejection. The buckets are inspected for deviation from true position in axial and radial planes. Deviations of more than ½° out of the design plane cause rejection because of the increased stresses set up in the bucket edges.

An idea of the forces and consequent stresses involved in this rotor assembly weighing but 150 lb is gained from the fact that there is enough stored energy when running at top speed to lift a 230,000 lb locomotive 3 ft in the air.

The final machining operations are performed using the buckets as a bench mark. The assembly is recentered from the bucket bases and the lengths are machined using the tip of the buckets as a base line. Fits for the bearings must be held within ±0.0002 in. and within ±0.0005 in. on the impeller and seal fits. Concentricity and squareness of shoulders must be held to within ±0.0002 in. to insure proper lineup and balance.

The junctions of the bucket bases in contact with the weld area are in effect incipient cracks which will progress in operation. If allowed to continue these cracks will progress to such a point that the wheel will be weakened not only permitting buckets to fly out but possibly bursting the wheel blank itself.

To arrest these cracks, holes are drilled around the circumference of the wheel in line with bucket base junctions just below the rim of the original wheel blank. In operation these cracks have progressed to the holes, but in nearly 2 years of operation one has yet to be found that has progressed beyond these holes.

Fig. 8 shows a section through a completed rotor assembly. It shows the location of these holes and was etched to bring out the position of the weld area of the buckets relative to the rim of the wheel and the flash weld area of the shaft to the hub of the wheel.

A high degree of accuracy is likewise required on the parts assembled to the rotor, the seals, spacers, impeller, and nut. The impeller is a steel bushed, open-type aluminum unit. It is completely machined from a finger forging. The blades are bent to proper shape after an annealing operation. Before the bushings are assembled and riveted in place, the impeller is balanced and given a high speed test at 21,000 rpm in a vacuum pit to prove the material and to give it a cold work set. In this operation the impeller bore is stretched out of shape, requiring a reboring before the steel bushings are assembled. After the bushings are assembled and riveted in place, the combination is given a second high speed test at 20,000 rpm. The impeller is then finished machined, including the bore, faces and contour, and given a static balance. The rotor is mounted on antifriction bearings, a radial thrust bearing at the turbine end and a roller bearing at the compressor end. These are precision bearings

designed with special clearances to compensate for high temperature operation. At best, antifriction bearings are comparatively short lived in this type of application. Tin-based babbitt bearings have been developed to give successful operation over the entire speed range and are at present test operating in superchargers on locomotives operating on a number of railroads throughout the country to prove their performance under all conditions before adoption.

The assembled rotor is dynamically balanced on its bearings in a balance machine. An air jet is directed onto the turbine buckets to get the rotor up to speed, thus assuring a free running rotor and avoiding any interferences that may be attributed by a mechanical means of driving. The balance is obtained by removing stock from the rings provided at the rim of the wheel for this purpose, and in the scallops at the outer edge of the impeller.

German Machine Tool Developments

DEVELOPMENTS in German machine tool design are described in a series of reports issued by the Office of Technical Services, U. S. Dept. of Commerce. The reports, prepared by American and British industrial intelligence investigators, indicate that the Germans did not have a large assortment of special-purpose, high-production machines, but did employ special devices and attachments.

Report PB-1284, 75c, describes an electrically operated copy-milling machine, featuring three directional table control motors that can reach their full speed of 1400 rpm in 0.008 sec, and reverse their rotation twice per second. Installation and operating information as well as illustrations of the working parts are included.

An automatic bar-chucking machine manufactured by Alfred H. Schuttee, at Koln Dutz, is described in a report PB-1338, 25c. This machine is reported to be more flexible than any automatic screw machine previously designed, and is especially adaptable to small shops where changes in tool setups are frequent. It is equipped with four spindles and six independently operated cross slides of the gunning type. Each spindle has an individual longitudinal tool slide, which is a radical departure from the conventional single tool slide with end working tools for all spindle positions. The index mechanism, carrier, stock feed, checking mechanism and other working parts are described, and a table giving characteristics of several models is included.

The manufacture and use of mechanical variable speed devices are described in report PB-3473, which sells for 25c. The Freider device is similar to the Reeves transmission. Another, the Cavallo drive, is unusual and shifts the driven member off center with the driving member by means of a cam action which functions by a work gear operated by a handwheel. Several illustrations of the Cavello drive and the Freider transmission are included.

Report PB-17546, $1.25 a copy, describes and illustrates two metal cutting machines built by Deckel of Munich. One, a profile milling machine, works on the principle of a compound pantograph with a ratio of 1:1 between the cutter and the stylus. An optical device prevents excessive gouging of the material. The second, a tool grinding machine, was designed to grind all types of milling cutters, broaches, drills reamers and hobs.

The hydraulic profile milling machine, described in report PB-18892 (50c), is an experimental machine built by Dr. Fritz Faulhuber at Nurrhardt. It is reported capable of reproducing any given profile within 0.0002 in. in any plane.

The British Intelligence Objectives Subcommittee made a report, PB-2067 (50c), on profiling machines, grinders, and thread rolling and grinding machines made by four German firms. One machine described is an optical form grinding machine equipped to form-grind both flat and circular work. It has a grinding wheel 125 mm diam. and can grind work up to 100 mm in diam. Magnification of projection is 40 to 1 and 17 to 1, and accuracy of ±0.0001 in. is obtained.

Special gear cutting machines used in the production of gears for German warships are described in report PB-20665 ($1.00). Spiral bevel hobbing machines, hob grinders and sharpeners, worm grinding machines, and experimental climb hobbing machines designed by Klinkelnbert at Huckeswagen, are described and illustrated. Design development and research on worm gearing at the Brunswick Technical College, and gear cutting techniques in use by Heindenreich and Harbeck, Hamburg are described. Manufacturing methods employed by the Tacke firm of Rheine in the production of small and medium size gear units, marine reverse and reduction gear units, divided train gear units and turbine auxiliary units are described.

A brief review of production and improvements in machine tools built by 34 firms in the Leipzig area is contained in report PB-28317 (35c). Reed M. Andress, vice-president and foreign manager of Barnes Drill Co., Inc., Rockford, Ill., and Frank J. Jeschke, director of field engineering, Micromatic Hone Corp., Detroit, prepared this report. Model numbers, capacity and other data on most of the machines are included. Part of the report is several pages of photographs of German surface grinders, internal grinding machines and shapers.

Several experiments conducted on a Pfauter gear hobbing machine equipped with giant hobs working upon the synchronism principle, were carried out at the Park Works of David Brown & Sons, Ltd. The report, PB-34034 (25c), of these experiments is by two members of this firm, and photographs show the machine, hobs and hob teeth.

Collected data on German manufacturing of spiral bevel gears during the war, contained in report PB-42656 (25c), summarize the most significant practices. Steels, machines, feeds and speeds, cutters, blank manufacture, hardening and lapping are described.

1000-Ton Diecasting Machine

° ° °

Cold chamber, all hydraulic, diecasting machine for aluminum castings up to 15 lb is described in this article. The unit is rated at 1000 tons clamping pressure, has a total injection pressure of 160,000 lb and features an automatic feeding system in which a tilting crucible furnace pours a metered amount of aluminum for introduction into the injection chamber.

AN all hydraulic diecasting machine for aluminum which develops a clamping pressure of 1000 tons and which incorporates an automatic metal feeding mechanism has been built by Hydropress, Inc., New York, for Aluminum Goods Ltd., Toronto. This machine has performed satisfactorily in test runs in the builder's shop and will shortly be installed in the Toronto plant. It will, when operating, be the largest diecasting machine in commercial use. The size of the cold chamber will permit injection of a maximum of 15 lb of aluminum, or a projected area of 250 sq ft. It is said to be able to perform consistently at 60 shots an hour.

Several other diecasting machines rated at 1000 tons clamping pressure were built by other companies during the war, but as far as can be determined are not now operating.

This cold chamber type diecasting machine, shown in fig. 1, is built with a 22-in. diam. horizontal main ram and a 9-in. vertical injection ram. The injection ram speed is variable up to 100 ft per min and operates with a pressure of 8500 psi on the ram head, giving a total injection pressure of 160,000 lb.

A particularly interesting feature of this unit is the method developed for automatically moving the molten metal from the melting furnace to the cold chamber. Fig. 2 is a diagrammatic sketch of this setup.

On a fully automatic cycle, this arrangement permits of automatic feeding of a metered amount of molten aluminum from the furnace directly to the injection chamber.

The melting furnace shown in fig. 3, is a Stroman oil-fired tilting crucible furnace which is so mounted that when tilted it pours directly into the small holding furnace. The amount of metal poured from the melting furnace into the holding furnace is controlled by two adjustable electrodes mounted in the holding furnace. When metal rises to the point where it touches both electrodes and

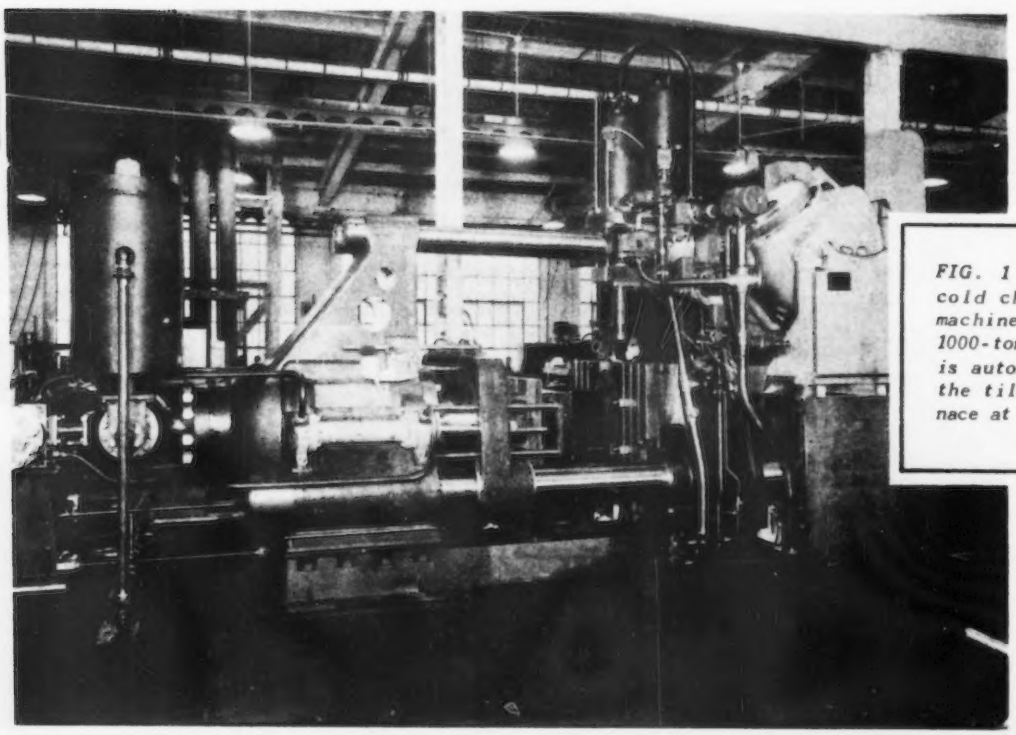


FIG. 1 - This hydraulic cold chamber diecasting machine which develops a 1000-ton clamping pressure is automatically fed from the tilting crucible furnace at the right.

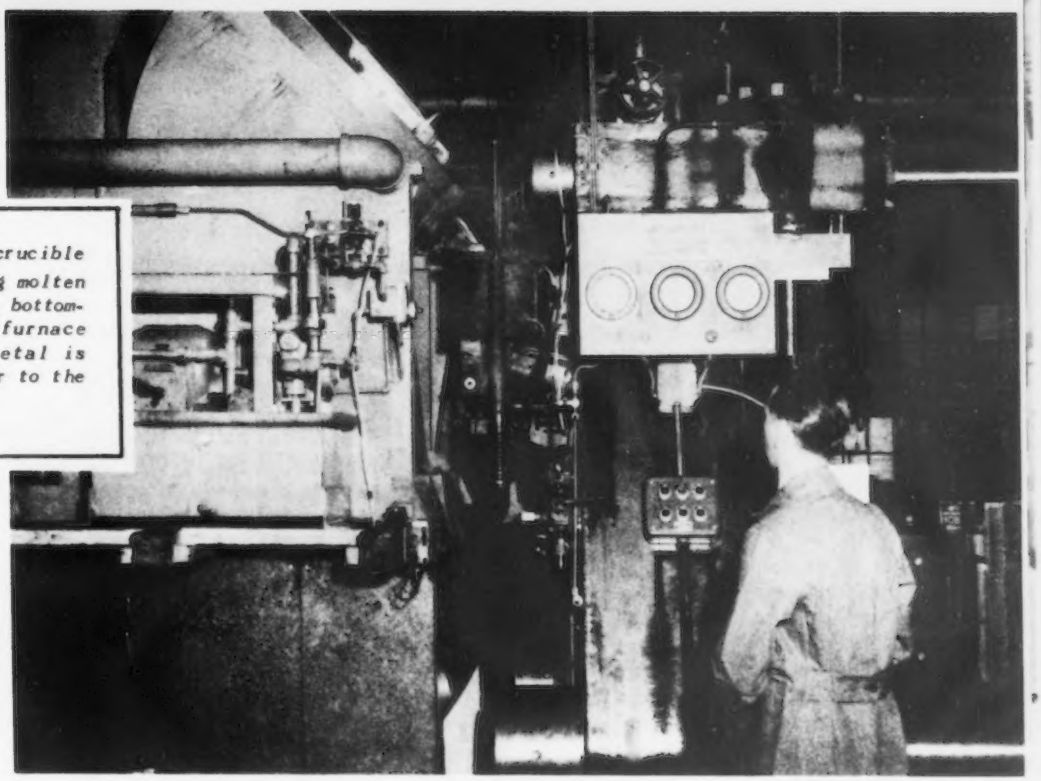


FIG. 3 - Tilting crucible furnace is pouring molten aluminum into small, bottom-pouring holding furnace from which the metal is carried by launder to the injection chamber.

completes the circuit between the electrodes, the tilting mechanism of the melting furnace is reversed sufficiently to stop the pouring operation. The amount of metal transferred to the holding unit is thus controllable by the height of the tips of the two electrodes. The electrode controls operate at 12 v.

The holding unit, which is equipped with Calrod units for maintaining the metal temperature, is of the bottom pour type fitted with a stopper actuated by compressed air cylinders. Actuating these stopper cylinders causes the measured amount of aluminum in the holding furnace to run onto a launder which leads into the injection chamber through an opening in the head frame. The launder is also equipped with Calrod elements to minimize temperature loss. From this point on the normal diecasting procedure follows.

The injection chamber of this Hydropress machine, shown in fig. 4, is built with an upper and a lower piston. The top piston moves down into the chamber to inject the metal into the die. After the injection, the lower piston moves up the chamber, cutting off the buscuit and raising the buscuit to the top of the chamber where an arrangement of levers and an air cylinder kicks the buscuit down a chute to a container at floor level.

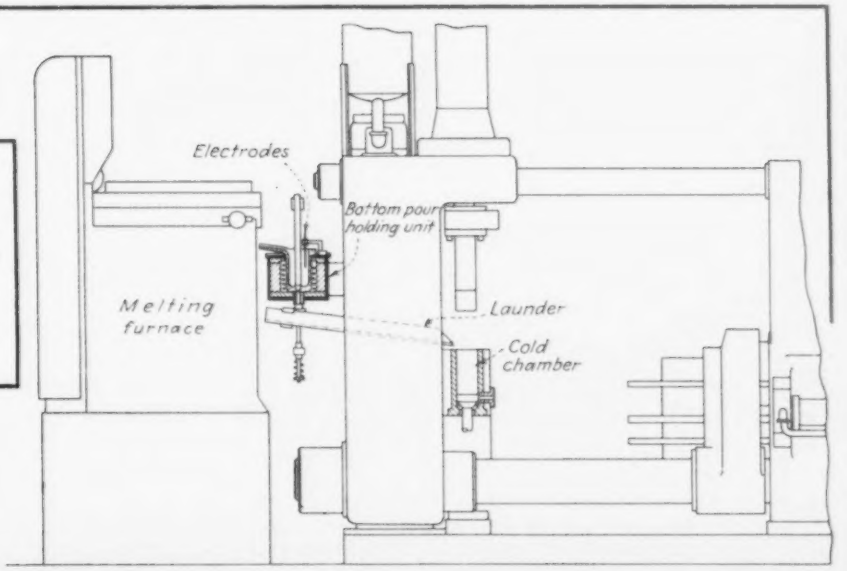


FIG. 2 - Diagram shows the feeding arrangement for metering and conveying molten aluminum to the injection chamber.

Electric Hot Topping

° ° °

ONE of the most noticeable and disturbing effects of ingot freezing phenomenon is the formation of pipe, a more or less cone-shaped cavity in the upper region of an ingot. Over the years many schemes have been tried in an effort to overcome this defect, which is caused by the manner of cooling of molten steel, setting into play forces that oppose contraction of the steel as it solidifies.

Recognition and subsequent adoption of various measures by the steel industry have gradually evolved to the generally accepted method of minimizing pipe—that of using a big-end-up mold, a preheated refractory hot top, and a dash of exothermic material on the molten ingot. Even this, however, is not completely successful in eliminating pipe, and conventional practice is to discard the portion of the ingot affected. This method is so wasteful that normal yields* are relatively low and inconsistent, varying from heat to heat throughout the industry from about 75 to 90 pct.

A development, that from all indications has contributed substantially towards a solution of the piping problem, has just been revealed by the M. W. Kellogg Co., Jersey City, N. J. Termed the "electric hot top" by its inventor, R. K. Hopkins, manager of the electric products department of Kellogg, this process is no longer a laboratory curiosity, but a commercial success substantiated by several years' experimental operations at the Allegheny Ludlum Steel Corp., Watervliet, N. Y. plant. Although this technique has been in use at Allegheny Ludlum and three other mills for some time, information has been withheld until establishment of the certainty of the process from a practical, operating point of view. Data released by Allegheny Ludlum on yields from 9-in. square ingots show that the method has been responsible for yields ranging from 92 to 96 pct, an average increase of more than 4 pct over the previous process.

References to yield are based on percent recovery of sound billet steel from teemed ingot, and include scale loss and top crop.

The Kellogg process involves supplying heat to the top of the metal teemed in an ingot mold while the teemed metal is covered by a protecting blanket of flux. This promotes solidification of the teemed metal with a minimum formation of defects due to shrinkage in a manner to increase the yield of sound ingot metal. The heat is supplied to the top of the metal teemed in a manner and in quantity controlled to provide a reservoir, of gradually diminishing size, of highly heated molten metal which feeds

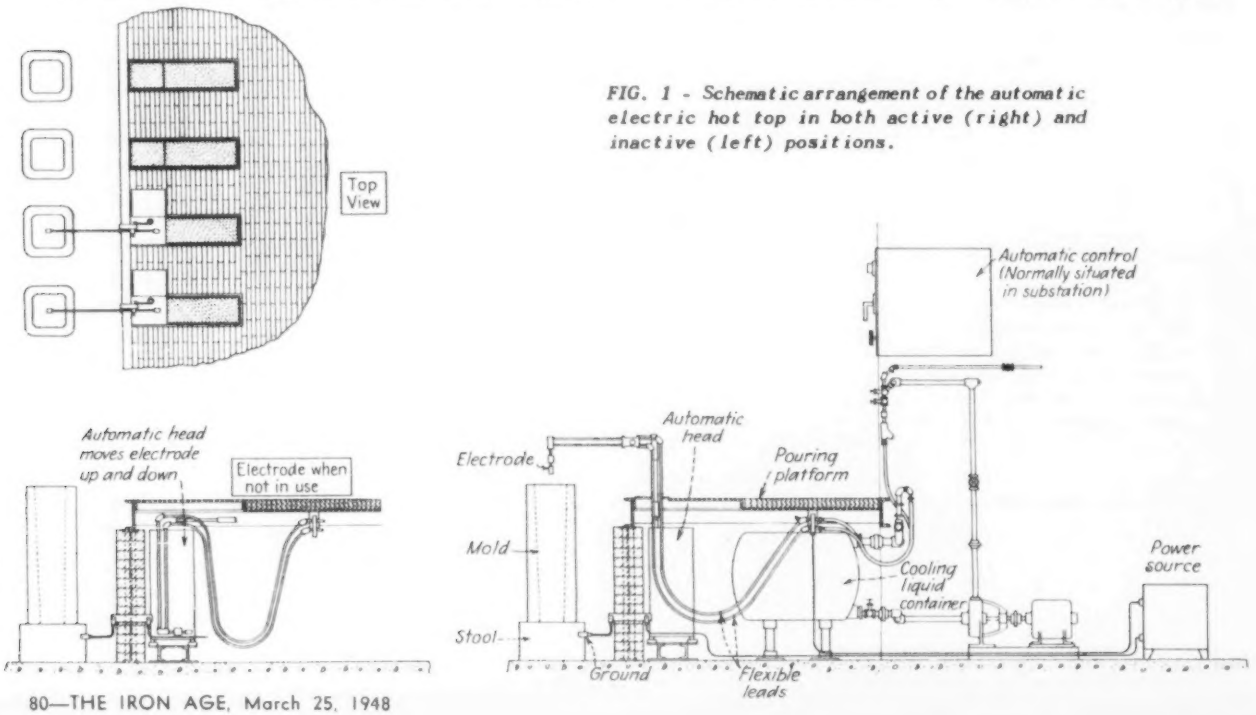


FIG. 1 - Schematic arrangement of the automatic electric hot top in both active (right) and inactive (left) positions.

Steel Ingots

By E. S. KOPECKI
Metallurgical Editor,
THE IRON AGE

Functioning virtually to eliminate the wasteful phenomenon of pipe, the electric hot top method discussed in this article offers the steelmaker a means for obtaining an increased and more consistent yield of sound ingot metal. Proved economically and metallurgically practical, the process has already been applied in the manufacture of a wide variety of steels and high-temperature alloys. Data included in this article are based on several years' experimental operations at the Allegheny Ludlum Steel Corp. and three other steel mills, and indicate the potential of the electric hot top technique in minimizing a problem that has plagued the steel industry for many years.

to the solidifying metal beneath as volume changes due to solidification take place, and which persists until solidification of the teemed metal is substantially completed.

The arrangement of the experimental automatic electric hot top installation at the Watervliet plant is shown schematically in fig. 1, in both the nonoperating condition and the operating condition. Fig. 2 shows four electric hot top units in action in the production of some 9x9x40-in. ingots of a high temperature alloy. Fig. 3 shows the same platform when the electric hot top is not in use. Essentially, the installation consists of a source of power and a liquid-cooled, nonconsumable, noncontaminating electrode. Heat is generated by the discharge of electric current from the end of the electrode, submerged in a flux, without detrimentally affecting the required properties and characteristics of the teemed metal.

The electrode, which is light in weight (about 23 lb) and small in size, is the only part of the equipment necessarily handled during the operation. With a power requirement of about 20 kw-hr per ton ingot treated, the operating voltage is low enough—only about 40 v—to remove any possibility of danger to personnel. The recirculating cooling liquid has a very low freezing point and minimizes the possibility of freeze-up in an open shop.

A highlight of the installation is the automatic control, which functions to (1) establish the operating voltage of the electrode, (2) maintain this voltage, (3) shut off the supply of energy input to the hot top at the proper time, and (4) withdraw the electrode from the hot top by acting through the automatic head.

The sequence of operations in teeming, when using the electric hot top, are pretty much the same as in conventional practice: Fill mold with molten steel; add powdered slag on top of ingot; place electrode into operating position; and throw switch on automatic. The two latter motions actually consume very little time and

FIG. 2 - View of four electric hot top units in action assisting in the manufacture of some 9x9x40-in. ingots of a high temperature alloy.

TABLE I

Analyses of Grades of Steels Studied

Grade	C, Pct	Cr, Pct	Ni, Pct	Mo, Pct	Si, Pct	Cb, Pct	Al, Pct
304	0.08	19.00	9.00				
303C	0.12	18.00	9.00	0.25			
316	0.10	17.00	12.00	2.25			
317	0.10	18.50	12.00	3.50			
347	0.10	18.00	11.00			8 x C	
416	0.15	12.50	0.25	0.30			
430	0.12	17.00					
440C	1.10	17.00	0.55				
755	0.42	24.00	4.80	3.00			
771	0.45	8.50			3.30		
791	0.80	20.00	1.30		2.00		
669	0.35	1.20		0.20			1.00

do not delay normal teeming practice in any way. The ladle crew can follow the ladle on down the line and need not worry about the electrodes that have been set into action. No additional help is required in order to use the electric hot top; stripping time is not increased.

Although the sketch, fig. 1, shows the ingot at floor level and the pouring platform at an elevated position, the operations can be just as readily performed if the molds are placed in pits. The sketch (fig. 1) and fig. 3 show that when the equipment is not in use, the platform is perfectly clear. When the equipment is in use, only a small space along the platform edge is required. In fig. 4 the electric hot top is shown in both the operating position and in ready standby condition.

The slag used is made from commonly-occurring materials, but is so important to the success of the operation, that present plans are to furnish certified slag made and tested by Kellogg. Importance of the slag lies in its chemical and electrical characteristics: Chemical, so that it neither removes elements from the steel nor puts them in; electrical, so that liberation of electrical energy will be introduced efficiently into the metal to effect complete feeding. Since the electrode is never actually in contact with the molten metal, the slag must be capable of carrying the electrical energy input.

The flux blanket may be applied to the teemed metal in the liquid or in the solid state and has such physical, chemical, and electrical characteristics and properties that it protects the teemed metal from the atmosphere, retards heat losses in such a way that the top end of the ingot is maintained in the liquid state while the rest of the ingot is allowed to solidify from the bottom up towards the top, facilitates absorption of segregates and impurities liberated in the metal during solidification, and promotes generation of the heat and its proper distribution to the top of the teemed metal.

In table I are listed the analyses of typical steels teemed in conjunction with use of the electric hot top, while in table II are indicated some typical yields* obtained. The metal recovery values in themselves are probably sufficiently high to establish the merit of the process, but of particular significance is the narrow spread between maximum and minimum yield figures. These results were obtained from

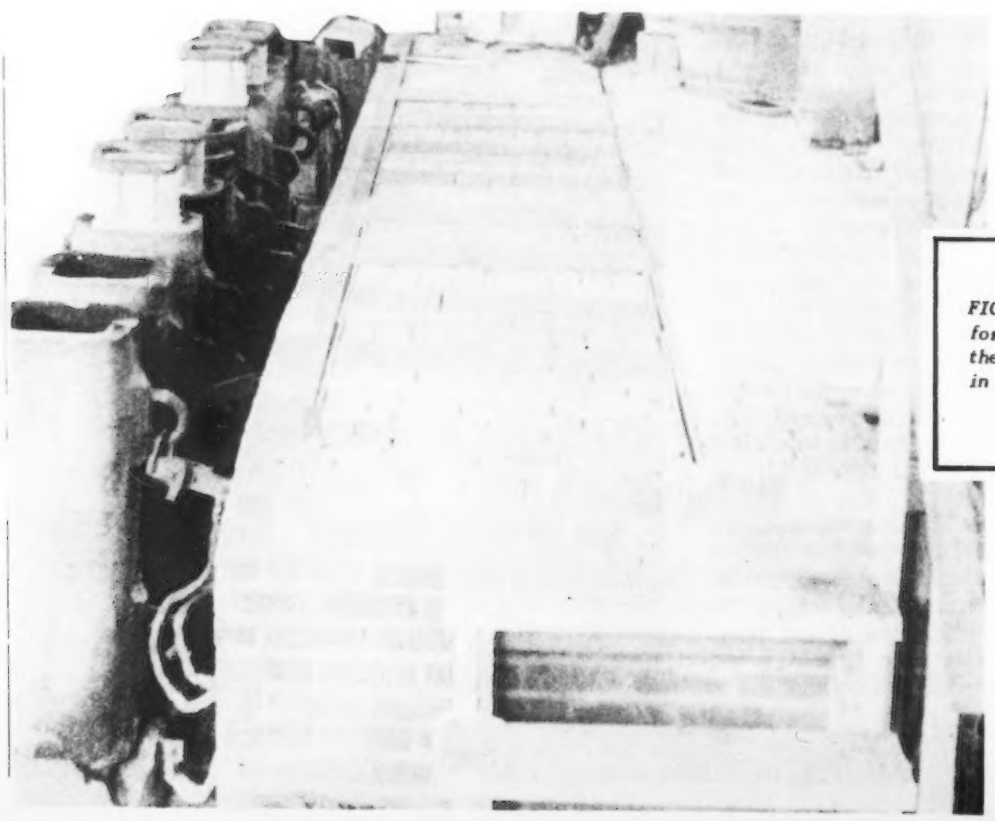


FIG. 3 - View of the platform shown in fig. 2 when the electric hot top is not in use.

separate *heats* of steel and not simply separate ingots from a single heat. For example, in ingots poured from ten heats of grade 303C stainless, a maximum yield of 93.4 pct and a minimum of 92.0 pct were obtained—a variation of only *1.8 pct in ten heats!* The other steels listed in the table follow the same pattern, indicating the flexibility of the process.

Ask any steel man what would happen to his operating costs if he could depend upon such a yield, consistently. The inconsistency of yields obtained with conventional steelmaking practice is known to affect steelmaking costs, but how many realize the extent of the effect, quantitatively?

A physicist at Kellogg recently struggled through some high-brow calculations based on some arbitrary costs and conditions and came up with an interesting relationship (fig. 5) that speaks for itself. The upper curve indicates, qualitatively at least, the effect on cost, per ton of steel at the shipping floor, of wide variations in conventional teeming practice yields as compared with (see lower curve) electric hot top practice.

Not only is there a substantial difference (in fig. 5) in production costs between the two methods in yield values if each were 100 pct reproducible (low points of each curve), but note also the comparison in variations in costs within each of the two curves. In other words, assuming that a crop was made on every billet based on a maximum yield value of 90 pct (upper curve) the cost would rise to $409.50 per ton due to the unnecessary work performed on the many billets with less than 90 pct yield that would have to be cropped at a later stage. If, on the other hand, cropping was done based on a minimum yield of say 70 pct, the cost would rise to $411 per ton due to the sound metal wasted in the many billets with yields higher than 70 pct.

Relative variations in yield of the electric hot top ingot are of such a low value that within the limits of maximum and minimum yields, the cost variation never exceeds about 50¢ per ton (see lower curve in fig. 5).

A thorough study of the economics of this process indicates that the cost of operation, including amortization of the installation costs, power, materials, and labor, is just about the same as the present hot topping cost.

A formula has been developed and checked against actual accounting department figures which shows the savings in dollars per ton on ingot cost resulting from the use of the electric hot topping process. This formula is:

$$IN = G\,(PBC - S) - (E + R)$$

where **IN** = net saving in dollars per ton of ingot cast, **G** = increase in billet yield in percent, **PBC** = present billet cost in dollars per ton of billet, **S** = value of remelt scrap in dollars per ton of scrap, **E** = difference in operating cost between the present hot topping method and the electric hot topping method (taken to be zero), and **R** = royalty in dollars per ton of ingot cast for the use of the electric hot topping process. This royalty is a small percentage of the ingot cost.

As an example, one might assume that the increase in yield **G** is 4 pct, the present billet cost, $250, and present scrap value, $65. With these values substituted in the formula, it is

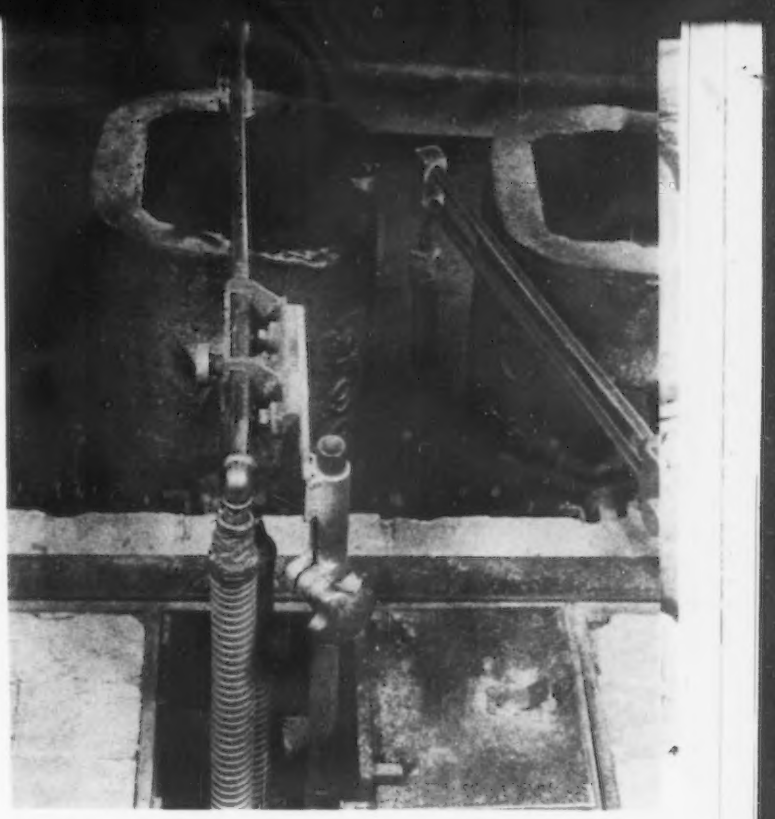


FIG. 4 - Photograph shows the electric hot top in both the operating position (at the left) and in ready standby condition.

TABLE II

Yields Obtained from the Electric Hot Top Process Ingot to Billet

Grade	No. of Heats	Mold Size and Set up	Billet Size	Rolled or Forged	Yields, Pct		
					Max	Min	Average
30C	10	9x9x40 Open	2 9/16	R	93.4	92.0	92.8
304	9	9x9x40 Open	2 1/8	R	95.2	91.9	93.5
316	5	9x9x40 Open	4	F	95.4	93.7	94.7
317	5	9x9x40 Open	4 1/4	F	95.0	89.0	92.5
347	5	9x9x40 Open	2 1/8	F	93.0	90.2	92.2
416	10	9x9x40 Open	2 5/16	R	92.1	85.9	90.6
430	10	9x9x40 Open	3 1/8	R	92.3	90.3	91.2
440C	5	9x9x40 Open	3 1/8	R	92.3	90.1	91.5
669	10	9x9x40 Open	3 7/8	R	91.7	88.2	89.9
755	10	9x9x40 Open	4 9/16	R	93.2	91.6	92.4
771	10	9x9x40 Open	2 5/16	R	91.8	89.8	90.7
791	9	9x9x40 Open	4 9/16	R	93.2	91.3	92.2
304	2	9x9x48 Open	2 1/8	R	93.9	93.2	93.5
304	2	9x9x48 Ref.	2 1/8	R	95.6	93.2	94.4
771	1	9x9x48 Open	2 5/16	R			91.3
771	2	9x9x48 Ref.	2 5/16	R	92.3	91.8	92.0
669	3	12x12x40 Open	7 1/2	F	92.8	90.0	91.8
669	1	16x16x48 Open	12	F			94.1
Average							92.3

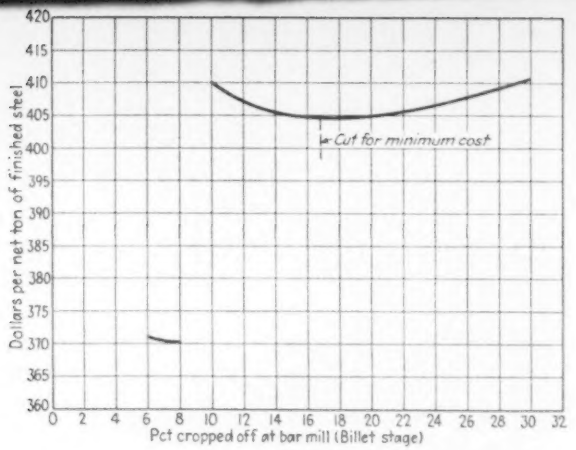


FIG. 5 - Comparison of costs between conventional steelmaking practice and use of the electric hot top. Calculations are based on arbitrary costs and conditions.

indicated that the saving per net ton of ingot would be $7.40 before deducting royalty. Royalty cannot be adequately considered herein, since this is a matter which must be settled with the licensee at the time the contract is signed. The general statement can be made, however, that since the royalty is only a very small percentage of the ingot cost, the user of the process would realize a substantial net saving.

Each installation is an entity within itself, and because of this no flat statement as to the length of time required to amortize the equipment can be made. It is indicated, however, from plants which have been studied that the equipment can usually be completely amortized within from 1 to 2 years' time.

The electric hot top method has been substantially standardized for teeming ingots ranging in size from 5 to 16-in. square. When the size of ingot gets beyond the scope of a single electrode, the quantity of electrodes is increased to an appropriate number. This technique was successfully applied in the teeming of some 100,000-lb slab-type ingots in molds measuring 90x40 in. in cross-section and 110 in. high. In this operation, in which the ingots were of the big-end-down type, bottom poured, and the steel teemed was of the plain carbon classification, eight standard electrodes were used simultaneously. Savings of 7000 to 10,000 lb per ingot were obtained, attributed directly to the electric hot top process.

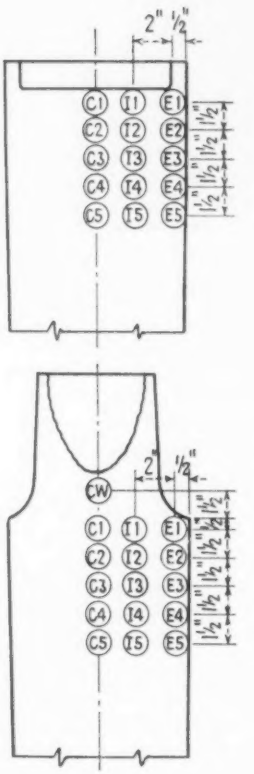
In addition to the steels listed in tables I and II, other alloys have been successfully hot topped, including types 303 and 410, valve steels (XB, XCR), 18-4-1 and other grades of high-speed steel, and high temperature alloys such as S816, S590 and S588, 16-25-6, 19-9 DL, N-155, etc.

The relatively flat surface obtained with the electric hot top, as compared with conventional

TABLE III

Chemical Analysis Data for Type 303 Ingot, 10 in. Square

Sample	C	Mn	P	S	Si	Cr	Ni
Ladle Test	0.068	0.75	0.027	0.323	0.43	17.58	9.24
Electrically Hot Topped Ingot							
C-1	0.073	0.68	0.025	0.307	0.44	17.25	9.20
C-2	0.071	0.69	0.027	0.304	0.39	17.35	9.30
C-3	0.068	0.69	0.025	0.296	0.38	17.45	9.20
C-4	0.063	0.69	0.024	0.284	0.39	17.45	9.12
C-5	0.062	0.72	0.028	0.288	0.40	17.45	9.22
1-1	0.075	0.67	0.027	0.320	0.40	17.45	9.40
1-2	0.063	0.67	0.026	0.324	0.42	17.55	9.28
1-3	0.065	0.74	0.027	0.328	0.43	17.65	9.32
1-4	0.067	0.76	0.029	0.328	0.42	17.65	9.28
1-5	0.066	0.74	0.026	0.328	0.42	17.65	9.28
E-1	0.067	0.77	0.028	0.316	0.43	17.65	9.30
E-2	0.069	0.76	0.027	0.312	0.42	17.65	9.26
E-3	0.071	0.79	0.026	0.312	0.43	17.65	9.26
E-4	0.070	0.77	0.027	0.320	0.44	17.65	9.24
E-5	0.070	0.77	0.027	0.316	0.42	17.65	9.32
Standard Ingot							
C-W	0.073	0.68	0.027		0.44	17.65	9.20
C-1	0.070	0.72	0.025	0.328	0.44	17.55	9.16
C-2	0.070	0.77	0.027	0.308	0.43	17.51	9.24
C-3	0.068	0.76	0.026	0.292	0.43	17.52	8.98
C-4	0.065	0.75	0.026	0.284	0.43	17.55	9.00
C-5	0.065	0.72	0.026	0.280	0.43	17.55	9.06
1-1	0.069	0.73	0.027	0.333	0.43	17.65	9.26
1-2	0.067	0.77	0.028	0.336	0.43	17.53	9.26
1-3	0.068	0.76	0.027	0.335	0.44	17.58	9.24
1-4	0.070	0.73	0.027	0.333	0.43	17.65	9.30
1-5	0.070	0.75	0.026	0.336	0.43	17.61	9.24
E-1	0.072	0.76	0.027	0.328	0.44	17.65	9.22
E-2	0.070	0.75	0.027	0.324	0.44	17.65	9.20
E-3	0.070	0.76	0.027	0.324	0.44	17.62	9.24
E-4	0.072	0.75	0.027	0.328	0.44	17.65	9.18
E-5	0.070	0.76	0.027	0.324	0.43	17.65	9.22



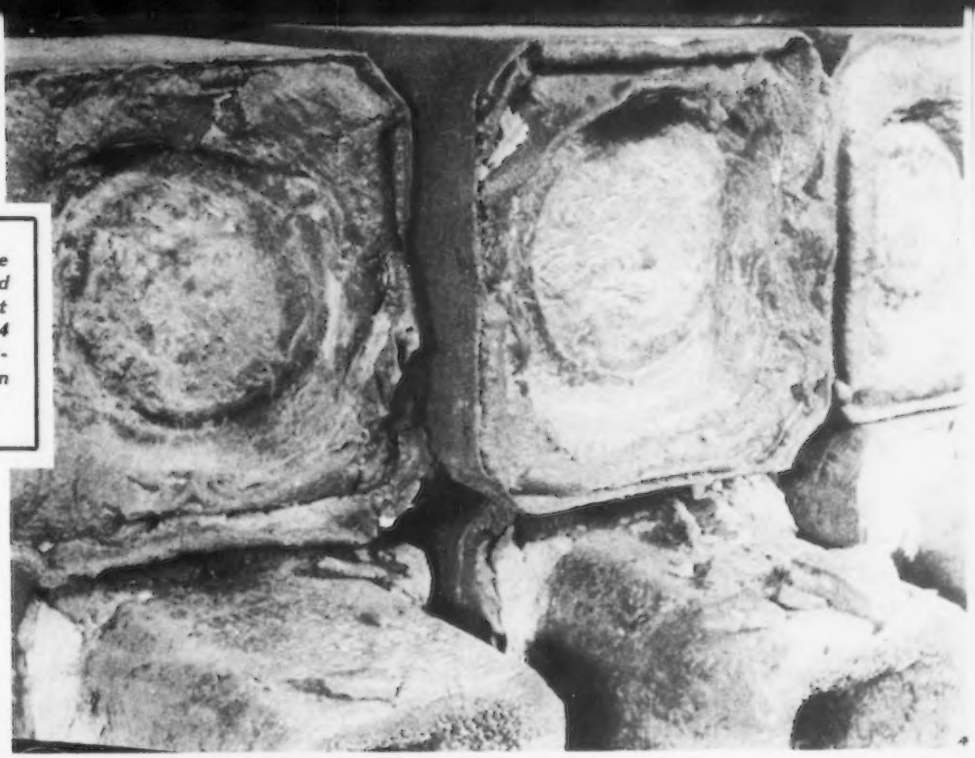


FIG. 6 - Top view of three electrically hot topped and three conventionally hot topped ingots of type 304 steel, with operations having been conducted in an open mold.

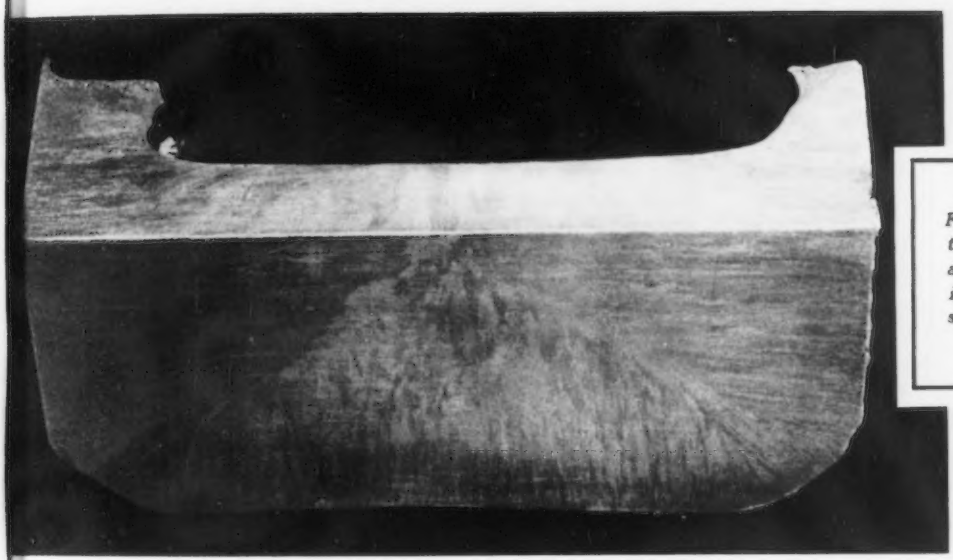


FIG. 8 - Cross-section of the top end of an electrically hot topped 9x9x40-in. ingot of type 347 stainless steel.

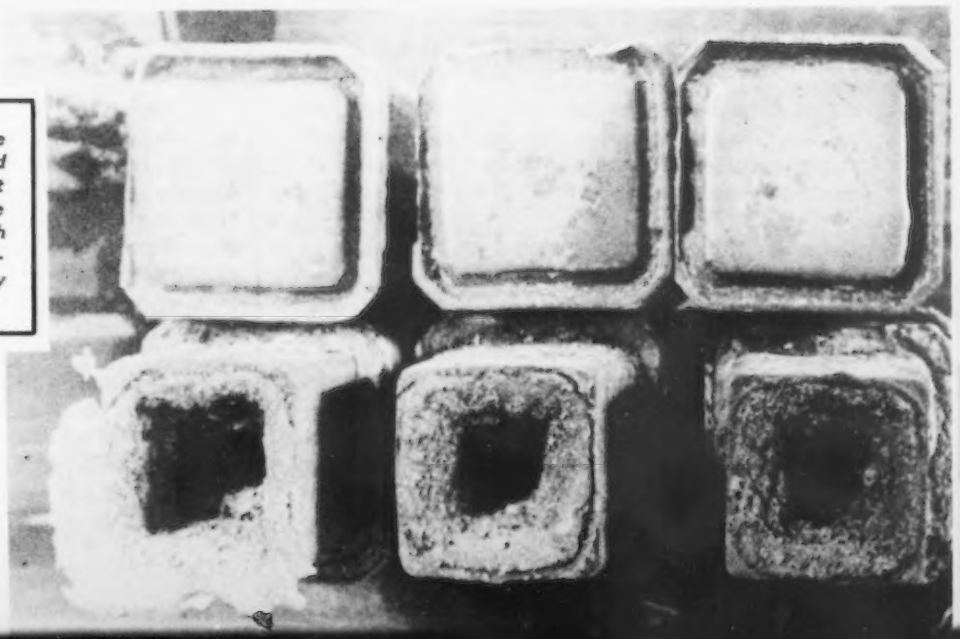


FIG. 7 - Top view of three electrically hot topped and three conventionally hot topped ingots of grade 771 Silcrome steel, with operations having been conducted using refractory liners.

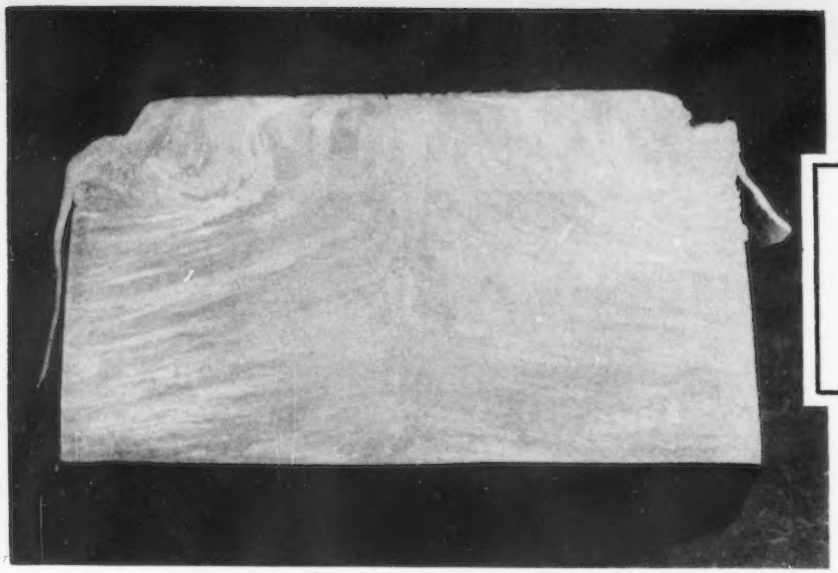


FIG. 9 - Cross-section through the axis of an ingot cast under the conditions shown in fig. 7. Steel is type 304 stainless.

practice, is illustrated in figs. 6 and 7. Fig. 6 is a top view of three electrically hot-topped and three conventionally hot-topped ingots, of type 304 steel, 9x9x48 in., the electric hot top operations having been conducted in an open mold. Note the characteristic soundness and cleanliness of the open mold method, shown more clearly in fig. 8, which is a cross-section of the top end of an electrically hot topped 9x9x40-in. ingot of type 347 steel. The raised sections at the left and right sides of the ingot in fig. 8 are intentionally produced and are actually advantageous. Energy input into the molten top layer of steel is controlled in such a manner that the metal initially frozen at the mold wall is not remelted. This solid section then protects the mold wall from the pool of molten steel produced and maintained by the electric hot top, and hence mold life is unaffected by this process.

Fig. 7 shows a similar comparison between the two methods, except that in this case the alloy is grade 771 Silcrome steel and the electric hot topping operation has been carried out in a refractory liner at the top of the mold. The fins at the outer edges were inadvertently produced by molten steel rising up between a poorly fitting refractory collar and the mold and freezing. The shape of the top portion is better illustrated in fig. 9, which is a cross-section view through the axis of an ingot so treated. This is a view of the upper region of the ingot as teemed, and no cropping has been performed. (What appears to be a line of demarcation across the top area is actually a machining mark and not a discontinuity in the crystalline structure.)

A refractory collar increases the yield of an electrically hot topped ingot by about 1 pct, and its use would have to be decided by each individual shop weighing the additional cost (of the collar itself) against the saving due to the increased yield. For high cost metals it would seem profitable to utilize a collar.

A close check on the chemical characteristics, table III, revealed the corresponding locations in an electrically hot-topped ingot and a standard ingot, of type 303 steel, to be closely similar in chemical analysis.

The temperature at which the metal is teemed is not as critical a factor as it is in conventional practice. The type of steel being poured, whether deep-piping or not, seems to make little difference, inasmuch as the yield on all grades is almost the same.

Oil Standby Equipment for Gas Burning Furnaces

FOR use in furnaces, ovens and other gas burning units where impending gas shortages may interfere with normal production, oil standby equipment providing the same Btu input per hr as existing gas burners has been developed by Surface Combustion Corp., Toledo.

The standby units which are teed into the fuel supply line, depend upon air pressure to atomize No. 3 or lighter furnace oil for combustion, and are applicable to practically all of the company's burners, both high and low pressure, in capacities from 70,000 to 3.5 million Btu per hr per burner. Oil pressures with No. 3 oil run from 100 to 150 psig. Required atomizing air pressure is 30 to 40 psig and approximately 3 cfm of air is required per gal of oil burned per hr.

On low pressure equipment and variable flame burners, atomizing air amounts to about 10 pct of the air required for combustion of the oil, the balance of the combustion air being supplied from the low pressure air piped in for burning gas. High pressure equipment requires somewhat more high pressure air, as it is used both to atomize the fuel and to induce from the atmosphere most of the air required for combustion.

For low and high pressure tunnel burners and all but the very small size low pressure velocity burners, the oil standby equipment can be permanently installed so that the burners will operate on oil or gas simply by control valve manipulation.

Combustion Oxygen in the Openhearth

Most attention, to date, concerning the use of oxygen in steelmaking, has been devoted to its functioning as an aid to carbon reduction, and relatively little has been said regarding combustion oxygen. In this article are summarized the experiences of Bethlehem Steel Co. in making some 400 experimental heats with burner injection.

PERHAPS the most satisfactory approach to discussing high temperature heat is through the notion of theoretical flame temperature, which is the ratio of heat input to the heat content of the combustion products; the former consisting mainly of heat of combustion of the fuel plus sensible heat of the fuel plus sensible heat of the combustion air. Thus, flame temperature can be increased by increasing the value of the numerator, by making use of preheated air, or by decreasing the value of the denominator. This latter method can be realized by changing the composition of the combustion air, i.e., utilizing oxygen, and thereby reducing the volume of nonreactive nitrogen.

Oxygen, it must be emphasized, is not a fuel and it adds no heat. Increased flame temperature through the use of oxygen enrichment results from reduction of the quantity of heat carried away from the melting zone by nitrogen, by reducing the fraction of nitrogen present.

The fundamental concepts of heat transfer by radiation enter into the picture, since transfer of heat from burner flame to charge is principally by radiation. As is usual with radiation, upon striking the charge — or the furnace walls or roof — heat energy may be absorbed or reflected. The emission-absorption factors have considerable influence in that oxygen enrichment does not necessarily endanger refractories, such as the roof, because steel scrap is a far better absorber than is silica brick. Therefore, even though both are exposed to the same quantity of radiation, the charge is heated at the higher rate; in fact, much

This is an abstract of a paper entitled "Operation of Oxygen-Enriched Openhearth Furnaces," delivered by J. S. Marsh, research engineer, Bethlehem Steel Co., Bethlehem, at the annual meeting of the American Institute of Mining & Metallurgical Engineers, Iron & Steel Div., held in New York recently. — Ed.

TABLE I

Effect of Oxygen on All-Cold-Charge Heats

Condition of Furnace	No. Heats	Tons per Hr			Fuel, Gal per Ton			Oxygen Per Ton, Cu Ft
		With Oxygen	Normal	Gain, Pct	With Oxygen	Normal	Gain, Pct	
OLD	10	6.9		17.0	33.0		14.3	1100
OLD	28		5.9			38.5		
NEW	4	8.85		40.5	29.5		14.5	1200
NEW	16		6.3			34.5		

of the radiation received by the roof is returned to the charge by reflection.

Another implication of the radiation equation favoring increased flame temperature in the first stages of the heat, is that rate of heat absorption is a function of area of surface exposed. For this reason, lighter scrap, which has higher surface-volume ratio, is faster melting. Further, the interior of the scrap can be heated only by conduction and nothing can be done about thermal conductivity; consequently, the thinner the piece, the less the effect of this limitation. Since maximum surface is exposed to the flame before melting has begun, early enrichment is highly desirable.

Experimental heats were made in a 200-ton openhearth furnace, oil-fired, with purity oxygen piped to the shop in a 3-in. line at an average pressure of 170 psi.

In fig. 1 are shown several nozzle forms that were tried. The first burner tested was of the type ordinarily used for the combined burning of liquid fuel and coke oven gas, i.e., it consisted of two concentric pipes within a water jacket; the inner carries the liquid fuel and the outer the gas, oxygen. It subsequently developed that this burner performed as well as any other. So far as heat time was concerned, there was little to choose among the burners, so when the operators showed an inclination toward type C (in fig. 1), this was adopted for nearly all subsequent work.

The degree of oxygen enrichment first tested was arbitrarily established at 27 pct. Increase to 33 pct resulted in no gain; enrichment to 25 pct was tried with results nearly the same as for 27 pct. This suggests that the first increments of oxygen added produce the greatest effect. These results were substantiated on a 135-ton furnace, as demonstrated by fig. 2.

A few heats were made by introducing the oxygen at the air intake, but it was found that, as compared with burner injection, gain was small, more oxygen was consumed, and no fuel was saved. The remainder of the tests were therefore made with burner injection.

Since the gain from oxygen enrichment results from faster melting, high scrap charges should

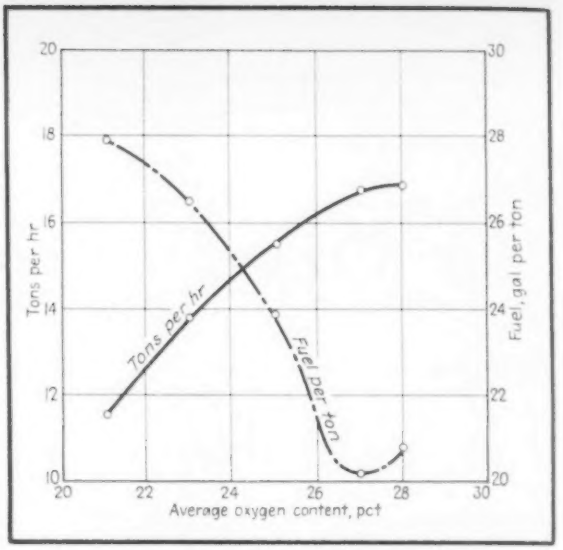


FIG. 2 - Effect of degree of oxygen enrichment on rate of production and fuel consumption as derived from data on 57 heats.

show most effect. The effect of variation of the fraction of scrap in the charge was investigated in a congested shop containing 21 furnaces, in an oil-fired, 135-ton furnace. Of a total metallic charge of about 300,000 lb. aim scrap charges were 85,000, 100,000, and 125,000 lb, respectively. Oxygen enrichment tended to smooth out ordinary variations of melting time. The high rate of melting permits continuous charging and the overall effect is the tendency to melt in about the same time elapsed from the start of charge. The fact that oxygen does produce the greatest effect on the higher scrap charge is of course contingent upon the ability of the shop to charge with sufficient rapidity.

An extreme of charge variation was obtained by using oxygen on cold-charge furnaces tapping about 60 tons. The metallic charge consisted of scrap and about 10 pct pig iron. Results of a few heats made in these furnaces, which normally pro-

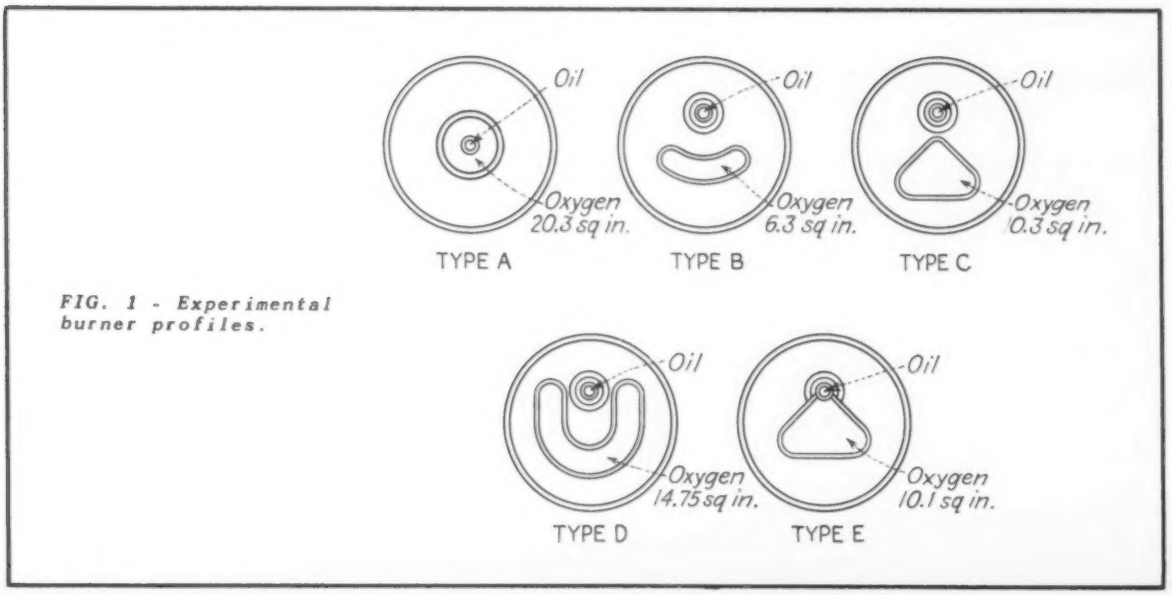


FIG. 1 - Experimental burner profiles.

TABLE II

Summary of Production Data On a Routinely Operated Ogygen Furnace

ITEM	OIL-FIRED			MIXED GAS AND OIL-FIRED		
	With Oxygen	Normal	Gain, Pct	With Oxygen	Normal	Gain Pct
No. Heats	149	28		96	31	
Cold-Charge Time, Hr — Min	1:45	2:18	24	1:50	2:29	13
Hot-Charge Time, Hr — Min	2:55	3:55	26	3:06	3:53	20
Melt Time, Hr — Min	6:32	7:25	12	7:35	8:28	10
Charge to Tap, Hr — Min	7:47	9:05	14	9:09	10:20	12
Heat Weight, Tons	134	138		136	133	
Tons per Hr	15.3	13.6	13	13.2	11.4	16
Oil, Gal per Ton	21.8	23.8	8	15.3	19.3	
Mixed Gas, Equiv. Gal				10.8	8.6	
Total Fuel, Gal per Ton	21.8	23.8	8	26.1	27.9	7
Oxygen per Ton, Cu Ft	674			609		
Oxygen Flow, Hr — Min	2:16			2:26		

duce at a rate of about 6 tons per hr. are summarized in table I. Results substantiated the work done with the larger furnaces with scrap-hot metal charges in that about 25 pct increase in tonnage and about 15 pct in fuel saving were obtained.

Although nothing abnormal about roof wear had been noted for the test furnaces, it was recognized that the behavior might be different for a furnace on which oxygen was used for every heat.

In all, more than 400 oxygen-enriched heats were made in five different furnaces which ranged from older types in congested shops to newer designs in modern shops. Charges covered the range likely to be encountered; i.e., from all-cold to over 60 pct. hot metal. Information obtained on some items was necessarily incomplete. For example, it was not proved conclusively whether or not oxygen has an effect on furnace life, although indications were that any such effect at least is not harmful. Further, it is clear that the production of an all-oxygen shop would not necessarily be the rate for one furnace multiplied by the number of furnaces.

It should also be mentioned that there exists a furnace factor which is intimately associated with thermal efficiency. The items lumped in thermal efficiency are well known, yet at first glance it may not be clear that, in general, as inherent furnace efficiency increases, the potential gain from oxygen enrichment necessarily decreases. Thus, rate of production with oxygen might be increased by as much as 50 pct with one type of furnace and as little as 10 pct or less, with another, despite constancy of items such as type of charge, charging time, and grade of steel made.

Production data for some 304 tests are listed in table II, including operations with oil-fired, and mixed gas and oil-fired, furnaces.

Twin Generator Process for High Btu Oil Gas Production

THREE shell sets, generating high Btu oil gas by introduction of an atomized mixture of oil and steam into a carbonizing chamber, produce a manufactured gas which, it is claimed, doubles or triples the thermal yield of sets using other types of fuel.

The system, known as the Twin Generator Process and developed by the Gas Machinery Co., Cleveland, produces gases which can be compounded so as to be interchangeable to a high degree with natural gas or can be made for distribution purposes to replace carburetted water gas, coal gas or equivalents.

Each three shell set has two generators and a superheater. To condition the set for operation, blast and oil burners are used to heat the brickwork in the bottom of the shells to around 1600°F. The burners are then shut off, the set closed and oil is introduced into both generators as is done in the carburetor of standard carburetted water gas units. In addition, steam is introduced along with the oil to pick up and gasify any free carbon or overcracked hydrocarbons by the water gas reaction, thereby preventing accumulation of carbon deposits.

Formation of the blue water gas tends to reduce the Btu per cu ft of the finished gas from about 1700 Btu to 1000 Btu. By controlling temperatures and steam volume, the Btu of the gas can be controlled within a range from 900 to 1100 even though that of the oil varies widely. Specific gravities from the low 0.60's to the 0.80's can be obtained depending upon cracking temperatures, time of contact and amount of blow run and purge.

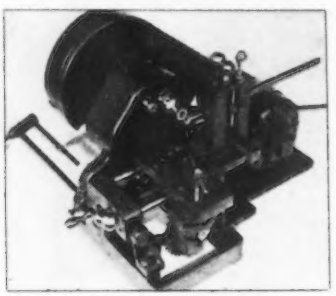
Production is carried on in cycles, as in operation the checkers cool and the oil begins to crack inefficiently. At this point the make oil must be turned off, the set purged with steam, then opened and the blast and burners turned on again for reheating the set. Optimum efficiency is generally obtained with a 3 to 4 min cycle.

New Equipment . . .

A bench miller, microhoning machine, a sand molding machine, a grinding attachment, internal carbide milling cutters, a trailer compressor, transformers and a redesigned line of induction motors are described this week. Also described are sapphire plug gages, holding fixtures and die sets.

Milling Machine

DESIGNED to save setup time, a combination milling machine has been developed by *Hyland Machine Co.*, 40 Potomac St., Dayton 1, which is useful on short run, high speed jobs. It provides two-speeds for fast, accurate cutoff of



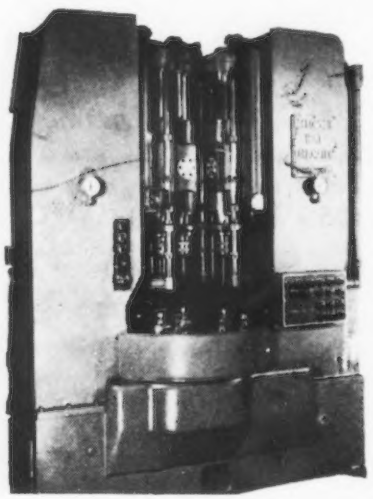
mild steel or brass, high carbon alloy or tool steels of any length. An adjustable stop may be set to cut lengths up to 15 in. or longer. Bar stock up to 1 in. diam can be handled on the machine, which uses metal slitting saws 5x3/32 in. or $\frac{1}{8}$ in. The machine mills flats, tangs, squares, Woodruff key slots and keyways, and requires a ¼-hp motor, 1750 rpm.

Grinding Attachment

A CIRCULARITY grinding attachment for grinding form relief, radial relief or both at once is made to fit any conventional cylindrical or cutter grinder. When not used for grinding cutting tool relief, it serves as a conventional motor-driven headstock. As the spindle of the attachment revolves, a cam generates the tool relief. The same cam is used for all tools, the amount of relief being changed by scale adjustment. Work is held in a collet chuck with capacity from 0 to 1¼ in., or between centers. For the latter, an attachment is provided. Relief grinding can be duplicated and if a setup is recorded from the scales on the attachment, that setup may be duplicated with exactly the same relief. *Detroit Reamer and Tool Co.*, 2830 E. Seven Mile Rd., Detroit 12.

Microhoning Machines

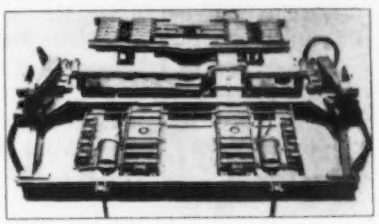
HEAVY duty, multiple spindle, unit constructed Hydrohoners have been announced by *Micromatic Hone Corp.*, Detroit 4. Spindles are mounted in quills and each quill is actuated as an independent unit. This type of design is used to reduce the weight reciprocated to a minimum and eliminates the necessity of guide bars. The torque and thrust are taken along the center line of the spindle. The expansion of the tools and the reciprocation of the quills are powered and con-



trolled hydraulically. The feed-out is positive and the pressure applied in each tool may be adjusted independently. Each quill is mounted on a separate column. By interlocking the hydraulic control panels, the automatic indexing table and the automatic sizing devices the operation is made entirely automatic. The machine illustrated is fixtured to microhone the cone bore of bearing races, the microhoning be performed in three progressive steps. It is rated at 500 parts per hr.

Molding Machine

DEVELOPMENT of a new rollover and draw molding machine has been made by *Herman Pneumatic Machine Co.*, Union Bank Bldg., Pittsburgh. This machine is for use when the jarring

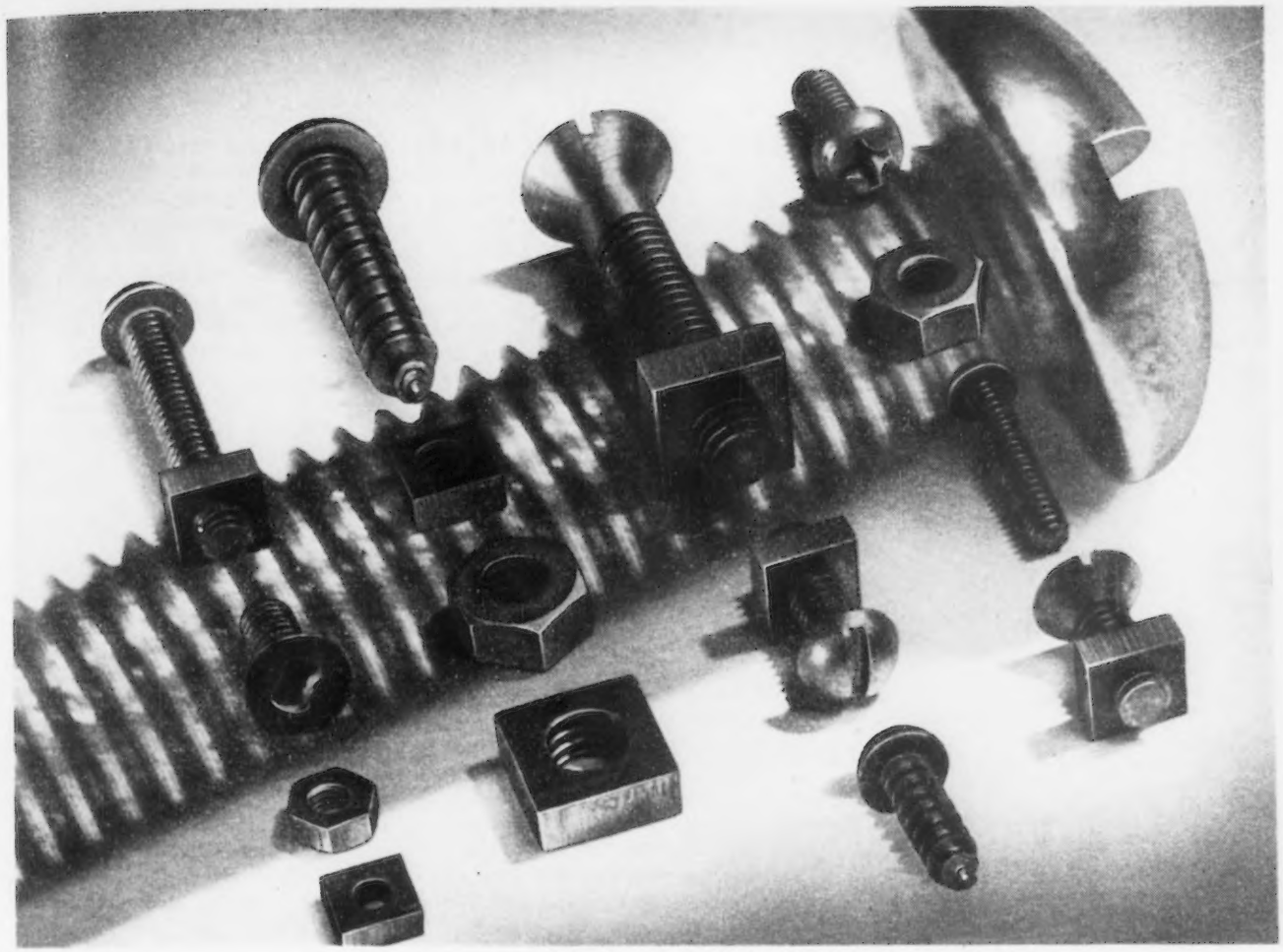


machine or sand slinger operates separately from the rollover machine. Features include special fabricated turnover plate, charging and discharging conveyer, automatic pattern clamps, automatic chain type flask or core plate clamps and direct acting vibrator. Machines are available from 750-lb capacity up to and including 40,000-lb capacity at 80-lb air pressure.

Internal Carbide Mills

MICRO-MILLS are now made with their forward end relieved, this improved design making it possible to finish the bottom of blind holes or face shoulders and ends of parts. Besides finishing holes in record time, which have the usual allowance of stock for internal grinding, the mills can be used for alterations after hardening and salvaging operations, and for the planetary milling of recesses, counterbores and countersinks. In fixed or indexed work positions, they will mill half-round keyways, annular grooves, cross slots and notches. A 11 32-in. size has been added to the

(Continued on page 132)



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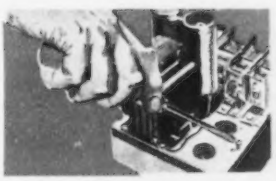

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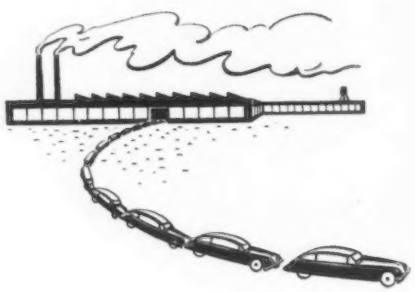
Assembly Line . . .

WALTER G. PATTON

• Stormy path seen ahead for auto industry . . . "Red" row shuts Briggs' Vernor plant . . . "Fringe" payments to labor total 12¼¢ per hr.



DETROIT—The auto industry is taking long production strides these days, but there are plenty of obstacles in the path for it to trip over.

A critical review of events reported in the press this week would indicate that on the surface at least all is well in Detroit. Underneath the surface, however, one could detect signs of events to come that may not augur so favorably for the industry.

This week, for example, the 1948 output of U. S. cars and trucks passed the million mark, just 73 days after the start of the new year. Adding Canadian production, this is at an annual rate of about 5.5 million. Ford reported that orders now on hand for its new extra heavy duty trucks (supposedly the softest product in the industry today) will absorb practically the entire 1948 production. Car manufacturers had anywhere from 6 months to several years orders ahead of them.

General Motors reported a peacetime sales record of $3,815,159,163 with earnings to common stockholders of $6.24 per share compared with $1.76 per share in 1946. Auto output was again flirting with a new high in the postwar period. The impression was easily gained that if gathering war clouds could be dispelled and by some remarkable legerdemain the steel supply could be jacked up the industry would easily establish an all-time production record during 1948.

Looking beyond the strictly favorable news, however, some observers here thought they could detect a series of developments which were much less promising. Rumors of buyer resistance of today's high prices for cars would not down, despite the optimistic pronouncements of auto sales managers. Products cost were increasing to an extent that Ford estimated its cost of new jigs, dies and fixtures would be three to four times the 1939-40 level

"We haven't finished our cost estimates yet," E. R. Breech, executive vice-president, admitted, "but there is a strong possibility that this increased cost will be reflected in the prices of the new cars."

Thus, even before the present wage negotiations between GM and the union and Chrysler and the UAW-CIO were finalized, there was talk of further increases in car prices.

But these are not the only shadows cast ahead of the industry. An important improvement in the flat-rolled steel supply was nowhere in sight. Automobile steel buyers were searching as frantically as ever for flat-rolled and bar steel. With pig iron desperately short, the gray iron casting supply was discouragingly tight and casting prices started at 10c. per lb.

John Lewis and his miners were on the loose again, and most observers knew from past experience that John usually had his way, at whatever cost to the rest of the country. The Red menace is growing and this week a row over alleged "Pinks" forced down the Briggs' Vernor plant when employees refused to work along side of three workers suspected of Communist sympathies.

Never free entirely from rumors, the motor capital buzzed this week with what happily turned out to be the biggest whoppers yet: It was reported that an auto plant had halted all production in favor of war work. There was also in circulation a vague rumor that most of the top automotive brass had been called to Washington to discuss plans for an emergency.

* * *

THE labor picture here is best described as "uneasy." Negotiations between Chrysler and the union recessed this week and the GM negotiations are just getting under way. If past experience is any criterion the fireworks by both sides will not take place for several more weeks. However, if agreement is not reached it may be confidentially predicted that the recent GM and Chrysler financial statements will give Walter Reuther and Company, plenty of ammunition to shoot off in the press and over the air.

Looking beyond the present negotiations, most sources here appear to share the opinion that the tussle over the Taft-Hartley Act has only begun. Whether such an attitude is justified or not, labor's viewpoint ever since it made its "slave labor" charges is that management is trying to use the Taft-Hartley Act to usurp labor's power. The union proposes to resist any such move by management to the limit. As some sources view the situation, 1947 was merely a period of watchful waiting on the Detroit labor front. The year 1948 will likely see the skirmish lines drawn and the battle between labor and management will begin all over again. This is, of course, provided international complications don't intervene in the meantime.

* * *

How much is labor being paid these days for not working?

According to a survey recently conducted by Automotive & Aviation Parts Manufacturers the cost of collateral or "fringe" payments made to hourly paid factory employees in the automotive parts industry averages out to more than 12½¢ per hr, over and above direct wages for every manhour worked during 1947.

ACCORDING to AAPM, for an employee working 2000 manhrs. during the year, these "fringe" payments amount to $245 per worker per year, over and above direct wages paid for work done.

The reports are based on returns

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Now at work in a leading automotive factory, this specially-built gage uses three P&W gaging methods for checking 14 piston dimensions to close limits. Diagrams on indicator panels show dimensions checked. At the touch of a button, piston is ink-marked with any of five grading symbols (indicating piston skirt diameter) for selective assembly. This is one of hundreds of P&W special gages.

form 100 plants which furnished 160 million man-hrs. of employment in 1947.

The way the payments are broken down is shown below.

According to AAPM these figures are on the conservative side. Legally-required payments for old age and survivor's insurance, workmen's compensation and unemployment compensation are not included. Other payments which might logically be classified as "fringe" payments could not be readily ascertained. Also, the agency said, the average costs for holidays not worked would be higher in 1948.

It may be safely assumed that compilations of facts such as these will be presented by many companies seeking to resist union "fringe" demands which are expected to be presented this year.

* * *

THE temper of the times so far as the Red menace is concerned is illustrated by the work stoppage at Briggs' Vernor plant this week when a notice was posted on the bulletin notifying three employees that other employees of the trim department would refuse to work with union members accused of having Communistic sympathies. On two different occasions, work in the department was disrupted but not stopped over this issue Last Friday, Briggs was forced to shut down the plant because of continued refusal of employees to work with the three suspected "Pinks".

Following the shutdown, Ken Morris, Local 212 president, called a membership meeting and announced agreement to allow the three to return to work pending their possible trial on charges of "conduct unbecoming union members."

According to latest reports, two of the three accused men are back on the job. But early this week it is reported that handbills were being passed out at the Vernor plant by employees wearing "Wallace-for-president" buttons which quoted anti-Red Walter Reuther, and the UAW-CIO Constitution as being strongly opposed to what was described in the handbill as "disicrimination" against workers because of their political affiliations. Incidentally, each of the accused workers is an ex-GI. None of the men involved has more than 2 years seniority, it is reported.

According to union sources, the Briggs row started because the three accused members had openly circulated literature of the Briggs Communist Club as well as Wallace-for-President literature.

If the Moscow party line is to sew confusion in the ranks of labor, it has apparently done a pretty good job in the case of the Briggs' workers at the Vernor plant.

* * *

THE Securities & Exchange Commission is going to air the Kaiser-Fraiser, Corp., Otis & Co. stock deal.

Investigators have been sent to Detroit, Cleveland, New York City and the West Coast to investigate the action of Otis & Co. and the First California Co. in withdrawing from the sale of Kaiser-Frazer's stock.

Wherever the fault may eventually lie in the Kaiser-Frazer stock fiasco, there can be no doubt but the financial upset has been a body blow to Kaiser-Frazer's optimistic expansion plans.

Most Detroit sources agree with SEC officials who have stated that the case "is a mess that calls for a complete and thorough airing."

Type of Payments	Average Cost Per Manhour Worked in 1947	Number of Replies Showing Payments In These Categories
Vacation Payments (including paid vacations and bonus in-lieu-of vacations	4.498¢	85 out of 85
Christmas or other special bonuses; Profit-sharing payments, etc. (not including incentive or production bonuses)	0.267¢	30 out of 85
Pay for holidays not worked	1.902¢	51 out of 85
Payments to union officials for settling grievances or negotiating agreements	0.169¢	48 out of 85
Legally-required payments (old age and survivor's insurance, workmen's compensation, unemployment comp.)	4.845¢	80 out of 85
Voluntary or agreed-upon payments (Employers' share of pensions, insurance, separation pay, etc.)	0.591¢	(varies widely by subdivisions)
Total	12.27¢	85 reports

Mobile Gas Turbines Now Being Developed For Emergency Power

Milwaukee

• • • **A short-notice** source of emergency electric current may be filled within the next few years by mobile gas turbine plants now under development. Allis-Chalmers Mfg. Co. reports that studies already have been made of 3000 and 6000 kw units to be mounted on railway trucks for rapid movement over normal railway track or comparatively irregular freight and utility yard tracks. The proposed units could operate as a sole source of power or could be synchronized with an existing power system. Simplicity, extremely smooth operation and no requirement for water would characterize the gas turbine plants. Operating on oil, the units would require only fuel line connections to tank cars or storage tanks, in addition to the electric transmission line connection.

The prime mover of 3000 kw unit operates on the simple gas turbine cycle with regenerator. With an inlet temperature of 1300 F, the unit would have a fuel efficiency of about 23 per cent at full load. Mounted on eight carrying axles arranged in four standard freight car trucks, the power plant would weigh approximately 230,000 lb. Sufficient oil-tank space is built into the unit to permit full load operation for at least 6 hours.

The turbine unit is coupled to a 3600 rpm generator through a reduction gear. All working air for the gas turbine plant and cooling air for the generator is taken in through filters in the side walls of the cab. Standard draft gear and air brakes permit these power plants to be moved in freight trains. The regenerator and air exhaust stacks for generator and regenerator must be removed for standard clearance.

The mobile gas turbine plants appear to be a very promising source of extra power which can be made available within a few hours.

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Washington . . .

EUGENE J. HARDY

• Steel capacity issue coming to life . . . Congress and White House showing new interest . . . Visas expected for German and Austrian scientists.

WASHINGTON—The recent furor over price increases in semi-finished steel has again set fire to the question of adequate steel capacity, since it is felt that supply and demand will not be in balance for some time and prices will continue to rise.

Another blast from pro-expansion advocates on Capitol Hill is expected very soon. The President's Council of Economic Advisers also has a man working full time on industry capacity and investment. He is Dr. Edgar M. Hoover, of the University of Michigan, who is devoting much of his time to studying steel capacity. However, Dr. Hoover is the only man in CEA working on this problem and for this reason is handicapped when it comes to issuing a full-dress report.

Another difficulty facing Dr. Hoover is the fact that CEA is not a statistical gathering agency, but merely makes use of data of other agencies on which economic analyses for the President are based. The inadequacy of available material on long term steel demand makes it rather difficult to come up with any plausible answer to the steel capacity dilemma. Dr. Hoover is trying to remedy this situation and is working closely with other government agencies as well as industry. He recently discussed the matter with officials of the American Iron & Steel Institute and the U. S. Steel Corp.

Dr. Hoover told THE IRON AGE last week that the council has not been asked to make a special report on steel capacity. Capitol observers point out that such a study may be ordered by the White House particularly since the CEA and Commerce Dept. reports on the semi-finished steel price increase did not tell White House politicos exactly what they expected to hear. At the present time, however, it seems likely that any data compiled by Dr. Hoover on steel capacity will be made a part of an overall economic report which will not be issued for some months.

* * *

AFTER months of endless delay, the State Dept. is reported as having worked out a plan whereby visas will be granted to German and Austrian scientists whose services are desired by American firms. As reported in this column last fall, the Army and Navy have made valuable use of the cream of the German and Austrian scientific and technical personnel, but industrialists who would like to secure the services of top technicians have been stymied by State Dept. red tape. In fact, only constant prodding by the Army and Navy and the Commerce Dept's. Office of Technical Services has brought any hope of action by the State Dept.

Once the State Dept. plan is put into effect, between 60 and 70 German and Austrian scientists will be able to find immediate employment in American educational and industrial research establishments. A small number of these people have gone to work for industry.

Twenty-eight technicians and scientists have been released by the Army and Navy to private firms which have taken over their contracts. Fifteen have come into this country under limited military custody—in this manner the Army asks for the personnel desired and then assigns them to the requesting company. However, this requires constant Army surveillance and military officials would like to see some system established whereby such personnel can be brought into the country by industry.

AT THE present time, six more are on their way under the limited military custody plan and other transfers from Army and Navy work are also in prospect. Included in the firms already employing German and Austrian scientists are the Dow Chemical Co., Brooks & Perkins, Inc., Koppers Co., Mantle Lamp Co. of America, and the Pacific Car & Foundry Co.

Educational institutions have also taken a number of these people —Texas University has a refrigeration engineer in its labs, a diesel engine expert is at North Carolina State University, and a top nonferrous metallurgist is working at the Illinois Tech State University. Other fields in which valuable work is being done are petroleum, electronics, chemical, and synthetic fuels.

When the State Dept. puts into effect its visa plant, German and Austrian scientists will still be screened by the Army. OTS, acting as the industry contact, will arrange for contracts, certification as to the ability of the person in question and arrange all other details. However, some other agency may soon have to take over this latter work since OTS has been wiped out in the current Commerce Dept. appropriations bill. If the bill is approved in its present form, the State Dept. will be given another opportunity to balk on its part of the bargain. This has happened before.

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Oil and Gas Put In Bid For 16.5 Million Tons of 1948-49 Steel

Washington

• • • **The oil and gas** industry has put in its bid for at least 16.5 million tons of steel as its share of the 1948-49 production under the proposed voluntary allocation program. About 8.2 million tons are estimated as required by the industry during the remainder of the current year and the remainder during the first three quarters of 1949. Quarterly quotas run from 2.5 to 2.9 million tons.

Estimates for a few major types of steel needed include 8,336,000 tons of tubular goods (including 961,000 tons for American expansion in other countries), 1,100,000 tons of hot rolled sheet (including foreign quarterly shipments of 13,000 tons), and 952,000 tons of forgings and castings. Requirements for plate are placed at 2,800,000 tons.

These figures represent minimum amounts which a steel requirements committee of the National Petroleum Council feels must be made available to the industry during the next 18 months, April 1948 through September 1949 if domestic requirements for oil and natural gas are to be fulfilled.

The committee, formed at the request of the Interior Dept., has reported that petroleum requirements of the nation will average 6,250,000 bbls a day for 1948 and rise to 6,550,000 bbls a day in 1949.

The figures submitted include 1.7 million tons of steel required to expand foreign operations by American interests; also included are estimates for containers such as drums and for transportation items such as tank cars, etc., which are not normally charged against the oil industry's requirements.

Needed among overall requirements are 7,707,900 tons (exclusive of castings and forgings) for production equipment, pipelines, refining and marketing facilities; 2,191,900 tons for natural gas transportation; 1,496,600 tons for drums and similar distribution equipment, plus 1,340,300 tons for farm and home storage; 1,120,400 tons for tank cars, barges, tankers, etc.; and, 1,723,600 tons for American operations overseas.

On the basis of the NPC survey, in order to increase the supply of petroleum by a million barrels daily over the next 18 months the sinking of new wells must be stepped up by 25 pct to make up for delayed drilling during the war. Loss of 74 million ft in new holes during the war period calls for a 1948 program of 37,600 new wells totaling more than 130 million ft of hole, and 38,300 wells with 134 million ft of hole in 1949.

About 11.2 tons of tubular goods are required to sink each 1000 ft of well plus another 4.2 tons for pumping units, sucker rods, valves and fittings, lease tankage, etc., involving 52.8 tons to the average well. Since stocks in a number of these items are depleted and, in a few cases, exhausted, much will have to come from current production.

An additional 17,200 miles of pipeline, using 2-in. or larger pipe, would be required to handle the increased production. This would take an estimated 1,524,700 tons of steel exclusive of 13,239 tons of structural steel shapes and 108,600 tons of plate for construction of the lines.

Handling of the additional production would require completion of at least the 62 natural gasoline, recycling and pressure maintenance projects which have been already started or scheduled for construction over the next 18 months. These would require another 359,000 tons of steel.

Additional transportation requirements were estimated to demand 370,900 tons of tankers (exclusive of orders placed with forein yards), 349,100 tons for barges, 324,300 tons for tank cars, and 50,000 tons for tank trailers exclusive of another 41,000 tons of steel to build additional trucks or tractors to pull them.

THE BULL OF THE WOODS — BY J. R. WILLIAMS

January Steel Output Up

Toronto

• • • **Canadian production** of steel ingots and castings in January attained the highest total since August 1946, and amounted to 257,726 net tons. This was 86.8 pct of total capacity and compared with 249,769 tons in December when the rate was 84.5 pct, and with 249,798 tons in January 1947. In the month under review, production included 247,768 tons of steel ingots and 8,958 tons of castings.

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West Coast . . .

ROBERT T. REINHARDT

• Los Angeles bar mill chances considered good . . . Sheets still critical and hope for relief through shipments from Japan fades.

LOS ANGELES — Only one of several steel producing and fabricating plants conceived here within the past 2 years apparently has passed beyond the embryonic stage.

Lewis B. Kean, president of the newly organized Century Steel Corp. of Hollydale, Calif., momentarily expects approval of the Securities and Exchange Commission for the sale of 4000 shares of $100 par class B common stock which will enable his organization to purchase the site and start construction of a merchant bar mill with a capacity of approximately 3000 tons per month. Several sites have been tentatively selected for the plant and negotiations made for the purchase of a 6 to 10 ton electric furnace and the necessary roll stands. However all action is pending until the decision of the SEC is made.

It is believed that this unit can be erected and put into action for approximately $250,000 which would leave $150,000 for operating reserve.

Cost of operating this small electric furnace has been computed to show a decided advantage over an openhearth operation and a ready market is at hand for the products planned. Mr. Kean has had a long career in the steel business and local observers are optimistic about the success of the venture.

Two other steel plants and rolling mills tentatively announced during the last year or two have apparently been abandoned, either through a lack of financial backing or because of the general belief that the new cold rolling mill to be installed here by Columbia Steel Co. will be more than adequate to supply local needs.

Sheets continue to be the most critical among the short steel items in this area although the situation generally seems improved over this same quarter last year. There is a prevalent belief that whatever relief has been afforded is due primarily to the extensive use of aluminum as substitute material and that the inroads made by this material in fields formerly held by steel may well continue after the steel drought has ended.

Here, as elsewhere, the entrepreneur has been having particularly tough going. A typical example is the Trus-Panel Corp. headed by J. C. Scurlock, which for almost 2 years has been attempting to get enough steel sheets to go into the production of pressed panels for ceilings and walls of office buildings, theaters, warehouses and similar large structures (THE IRON AGE, May 30, 1946, p. 72).

ACCORDING to Mr. Scurlock these pressed panels have found a ready market among architects and engineers and thousands of square feet are already in use. Approximately 5000 sq ft were installed by the Fox Theater Co. in Culver City at considerable savings over lathe and plaster ceilings. He reports that this material, fabricated of 26 gage cold-rolled steel, was installed for less than 25¢ a sq ft.

However, because of the sheet shortage this company has found ready acceptance for aluminum panels which are being offered at approximately 6¢ to 8¢ more per sq ft than for steel. The aluminum alloy most generally used is 3SO which weighs approximately 0.4 lb per sq ft.

At present the corporation is buying presstime in job shops and will probably continue to do so until materials become available in large enough quantities to warrant independent production of the five basic patterns. Sales have been placed under the direction of L. J. Hoenig; Alfred W. Knight is vice-president and Edward Tuttle is secretary-treasurer. Affiliated with the company as a director is Richard W. Shoemaker of San Francisco who is regarded as an authority on radiant heating for which these panels in "sandwich" form are especially recommended.

What little hope was raised in the minds of steel sheet users of the West Coast that the 25,000 metric tons of hot-rolled sheets being imported from Japan by Yaras & Co. was coming to this area has been almost completely dispelled by unconfirmed reports that this material is destined for South America. Company officials still refuse to state the destination of the sheets which they are importing in a deal involving the shipment of coking coal to Japan. (THE IRON AGE, Jan. 2, 1948, p. 88)

Gordon E. Behr, division manager for Yaras & Co., who recently returned from Japan told THE IRON AGE that similar transactions which would result in alleviating the local sheet metal situation might be negotiated and that the Japanese steel industry could well be an important factor in restoring a trade balance to Japan which was so essential to its economic restoration. The prime requisite of the industry across the Pacific is coal, particularly of coking quality, he said. Coal production there was seriously retarded when large numbers of Koreans who had been working in the mines were released. Production during 1944 was approximately 60 million tons of coal per year but during the next 2 years this was reduced to approximately 24 million, and is now approximately 3 million.

PRESENT shipments of coking coal from Vancouver, B. C. through Seattle are costing approximately $30.00 per ton cif in Japan.

According to Mr. J. Z. Reday, who just returned to this country after having served 2 years as chief of the industrial division of SCAP, the most important problem confronting Japan today is the restoration of international trade and that the problems of labor, produc-

15 K. W. TOCCO unit brazing tools.

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tion costs, markets, trade zones and other economic factors must be settled and the profit motive restored to business there. He told THE IRON AGE that in his opinion the overseas consultants of the present administration were placing undue emphasis on the restoration of plants and plant capacity at the sacrifice of the broader economic factors.

Mr. Reday was pessimistic about the possibility of extensive shipments of steel scrap being made from Japan to this country. He said that there was probably ¼ to ½ million tons of nickel alloy steel there which could be exported if anyone wanted it but that the 4 or 5 million tons of usable steel scrap in Japan should be left there for use in Japanese furnaces. Oddly enough the use of this material is restricted because of the lack of carbide for use in the cutting operation. Apparently all of the available carbide is earmarked for fertilizer in agriculture because of the extreme necessity for increasing food production.

HE further pointed out that although the scrap might be returned to the United States it would eventually be necessary to reship scrap to the Orient as it has been and will continue to be a scrap scarce area. Historically, openhearths there have been charged with 60 pct scrap and 40 pct pig iron and that this ratio would probably continue because of the high cost of iron production in Japanese blast furnaces.

It is estimated that Japanese blast furnaces can produce approximately 45 million tons of iron per year using high grade ores from Hainan Island, Chinese territory and from north China and Malaya.

The steel producing areas of north Kyushu, Osaka, Kobe, Tokyo, Yokohama, and north Japan, have been damaged but little and are in a favorable condition to supply substantial quantities of steel to the rest of the world.

In summarizing the present Japanese economy, Mr. Reday stated that it might be considered to be at the 50 pct level of the 1930 to 1934 average and that with all factors considered, progress was being made in restoring a normal situation. Principal deterrents are the lack of fuel and power and some raw materials. He indicated that complete recovery of the conquered nation was being delayed by maintaining a barter economy and that until normal trade relations can be made. Japan will be dependent upon the U. S. for economic survival.

POWER PLANT: *An overhead crane is lowering a turbo-supercharged 1500-hp diesel engine into a locomotive chasis at the American Locomotive Co. plant in Schenectady, N. Y. The company reports that 92 pct of its accelerated production schedule calls for diesel-electrics.*

Canadian Output For Year Well Above 1947

Toronto

• • • **Canadian production** of primary iron and steel shapes for the month of December totalled 270,922 net tons as compared with 272,265 in November and with 243,791 tons in December 1946. Output for December included 262,567 tons of carbon steel shapes and 8,355 tons of alloy steel shapes. In the production figures for December are included 84,376 tons shipped to producers own plants or to other plants within the primary industry for further processing.

For the full year 1947, production of primary iron and steel shapes totalled 3,160,411 net tons, while shipments for sale amounted to 2,355,463 tons. For the corresponding period of 1946 production totalled 2,375,530 tons.

Canadian Import Ban Is Not Too Serious

Toronto

• • • **Canada imposed** her import ban on certain capital goods at the beginning of March, but so far the restrictions have not been as serious as were earlier expected. Instead of widespread shutoff of machinery, structural steel, etc., only about half a dozen items on Schedule III went into effect. Government officials decline to give further enlightenment as to when other items will be added to the banned list.

According to advice from Ottawa efforts are being made to divide capital goods imports into several classifications. Capital goods are being split as between those which are permanent and those that are considered consumable. The former are to be considered on an individual permit system. The latter, including such items as twist drills, milling cutters, etc., will be handled on a dollar allotment basis.

It is believed that importers of the consumable capital goods will be placed on a "dollar bank account" based on their actual imports for the year ended Oct. 31, 1947. However, it has not been made clear as to what actual allocations will be for 1948, but it is believed it will run about 75 pct.

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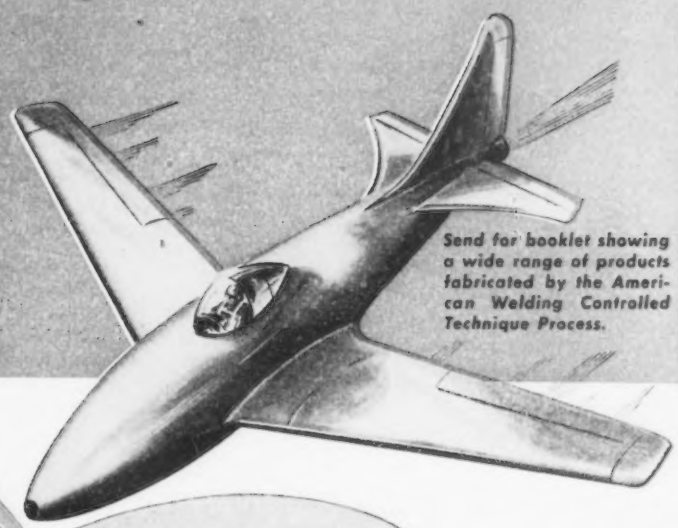

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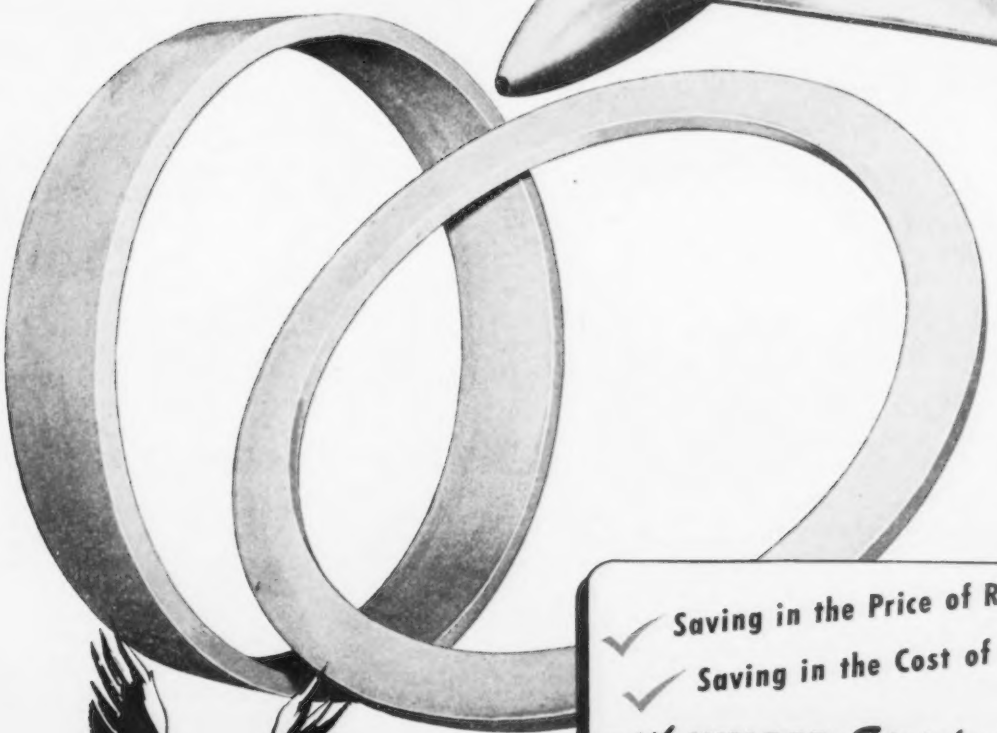

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PERSONALS

o o o

• **John D. Judge** has been appointed executive vice-president of Tube Reducing Corp., Wallington, N. J.

• **G. D. Myrick,** formerly supervisor, appropriations and operating studies, Tennessee Coal, Iron & R.R. Co., Birmingham, has been appointed staff analyst-operations.

• **Roland C. Disney** has been promoted to the position of manager of domestic sales of the Baldwin Locomotive Works, Philadelphia. He joined the Baldwin organization in 1946 as eastern district sales manager, and in 1947 was appointed assistant general manager of sales, which position he held until his recent promotion.

• **Roger W. Batchelder** has been appointed assistant to the president of the National Bearing Div. of American Brake Shoe Co., New York, and **William H. Old** has been appointed general purchasing agent for American Brake Shoe. Mr. Batchelder, formerly general purchasing agent for the company, has been with Brake Shoe since 1933. In his new position he will be located at the division headquarters in St. Louis. Mr. Old, formerly assistant general purchasing agent, has served in various purchasing capacities since he first joined the company in 1940. He will continue to be located in New York.

ROGER W. BATCHELDER, assistant to president, National Bearing Div., American Brake Shoe Co.

• **Ralph B. Gilbert** has been appointed staff assistant to John O. Yeasting, assistant to the president of Boeing Airplane Co. at Seattle.

W. W. McCutcheon, who has been supervisor in the quality and inspection department at Seattle, has been named chief inspector of the company's Wichita, Kan. division.

Fred A. Yearin succeeds Mr. McCutcheon in Seattle.

• **Addison Farrell** has been named assistant traffic manager for the Permanente Metals Corp. of Spokane, and **Kenneth M. Barnes** has been named district order supervisor at the Cleveland office of the company.

• **Arthur J. Wieland,** a director of the Wilson Foundry & Machine Co., Pontiac, Mich., has been elected vice-chairman of the board.

• **Chester Bland,** president of the Ohio Electric Mfg. Co., has been elected to the board of directors, Superdraulic Corp., Dearborn, Mich.

• **Henry Harnischfeger** has been elected a vice-president of the Harnischfeger Corp., Milwaukee. He has been a member of the board of directors.

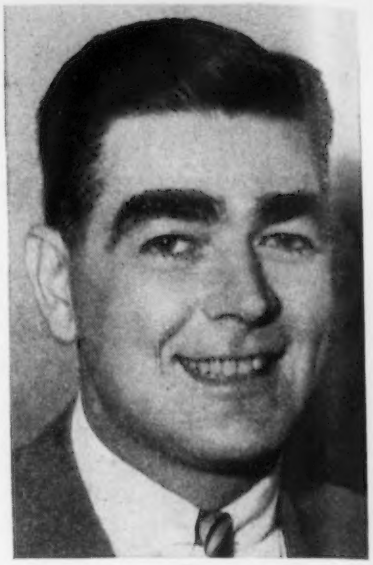
• **Foster C. Koehn** has been appointed plant engineer for the Falk Corp., Milwaukee.

• **F. H. Case, Jr.** has been appointed representative, public relations, American Steel & Wire Co., Cleveland. In his new capacity, Mr. Case will have charge of public relations activities for the company in the plant cities of Worcester, New Haven, Conn. and Trenton, N. J. His office will be in Worcester. Mr. Case started with the Wire company in 1930 and became office manager in 1941, serving in that capacity until his present appointment.

• **John F. Shea** has been named manager of the San Pedro, Calif. yard of the Shipbuilding Div., Bethlehem Steel Co.

• **E. F. Phillips** has been appointed manager of the Spokane branch of Crane Co. to succeed **M. J. Golick,**

• **Lars Carlson** has been appointed manager of sales and service for the Chicago branch of Brown Industries of Spokane. Mr. Carlson was formerly sales manager for the Washington Brick & Lime Co.



ALLEN D. MESSNER, president, Betz-Pierce Co.

• **Allen D. Messner,** assistant to the president, Thompson Products, Inc., has resigned to become president of Bet-Pierce Co., Cleveland. He succeeds the late Ray D. Love.

• **Fay Brainard** has been appointed to assume the newly-created position of special assistant to Eugene Caldwell, general manager of the Hyster Co., Portland, Ore. Mr. Brainard has been plant engineer of the Portland plant since joining Hyster in 1942. **Svante Eikrem** assumes the plant engineer position. Since joining the company in 1943 he has worked on assembly line layout and on tool design in the Portland plant.

• **Clinton E. Stryker** has been elected president of Maysteel Products, Inc., Milwaukee. Mr. Stryker was formerly president of Adel Precision Products Corp. and Aerco Corp., Burbank, Calif.

• **Marshall E. Munroe** has been made tractor purchasing agent of Harry Ferguson, Inc., Detroit. He joined Harry Ferguson, Inc. in 1939 as factory representative at Cleveland.

• **Frank H. Olton,** sales manager of Samuel Moore & Co., Mantua, Ohio, has been elected vice-president.

• **Urban D. Gosselin** has been named assistant to Clifford S. Strike, president of F. H. McGraw & Co., Hartford. Mr. Gosselin has been with the company since 1935.

(CONTINUED ON PAGE 136)

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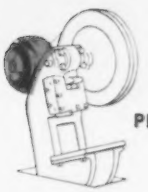
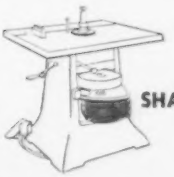

PRESSES


REDUCERS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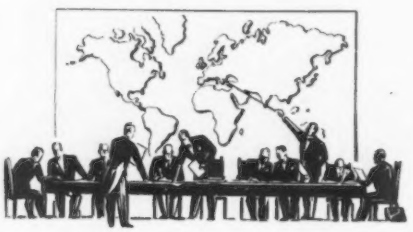
European Letter . . .

• Unless aid comes soon, prospect of a decent standard of living for British people will be delayed indenitely . . . Britain is solely dependent on what U. S. sees fit to provide.



LONDON—When the Economic Survey for 1947 appeared 12 month ago, the country was gripped in ice. Spirits were low; the outlook was dark; and the government's collection of targets and estimates was frustrated at the very moment of its appearance. The Economic Survey for 1948 appears at a moment even more critical for British destiny. The British economy is denuded; it is now using up its last reserves; and the government has brought itself frankly to the devastating admission that "without further substantial external aid" there is no hope of economic stability and a reasonable standard of life within the next few years. Unless aid comes, wholesale unemployment, distress and the dislocation of production will delay "for years" the prospect of a decent standard of living for the British people. There is only one thing wrong with this assessment. The delay would not be for years; it would be for all time.

The stark realism of the White Paper says little that is fundamentally new to those who have followed with proper concern the gathering economic storm. The damaging reduction of Britain's gold and dollar reserves to a precarious level—enough, perhaps, to last for another 6 months without further aid—has continued ever since the suspension of sterling convertibility last August. It is that fact more than any other which conditions the economic prospect for the present year.

Indeed, it comes near to defeating any attempt at planning at all in 1948, for planning in any real sense will be possible only if American aid is forthcoming. The Survey acknowledges this fact at several points, but nowhere more openly than by limiting its planning for imports to the first 6 months of the year, of which nearly half has already expired. Imports from the Western Hemisphere are to be cut to a level "no more than sufficient to maintain the nation in health and working efficiency." There is no allowance for the long overdue rebuilding of stocks of primary raw materials, for the lack of which production is being interrupted and kept in check. The country has reached such a level of financial exhaustion that it cannot afford a heavy investment in additionad supplies of materials, though they would bring "a rich return."

THIS is a prospect alarming enough, though not exactly newly discovered. It suggests that, for all the brave talk of democratic planning in the Survey, the conditions for the progressive ordering of economic affairs in Britain do not exist. Planning implies control over the economic environment; the ability to use resources in a variety of ways and to choose freely between the different ways; a real degree of independence of charity, good luck, or economic exhaustion.

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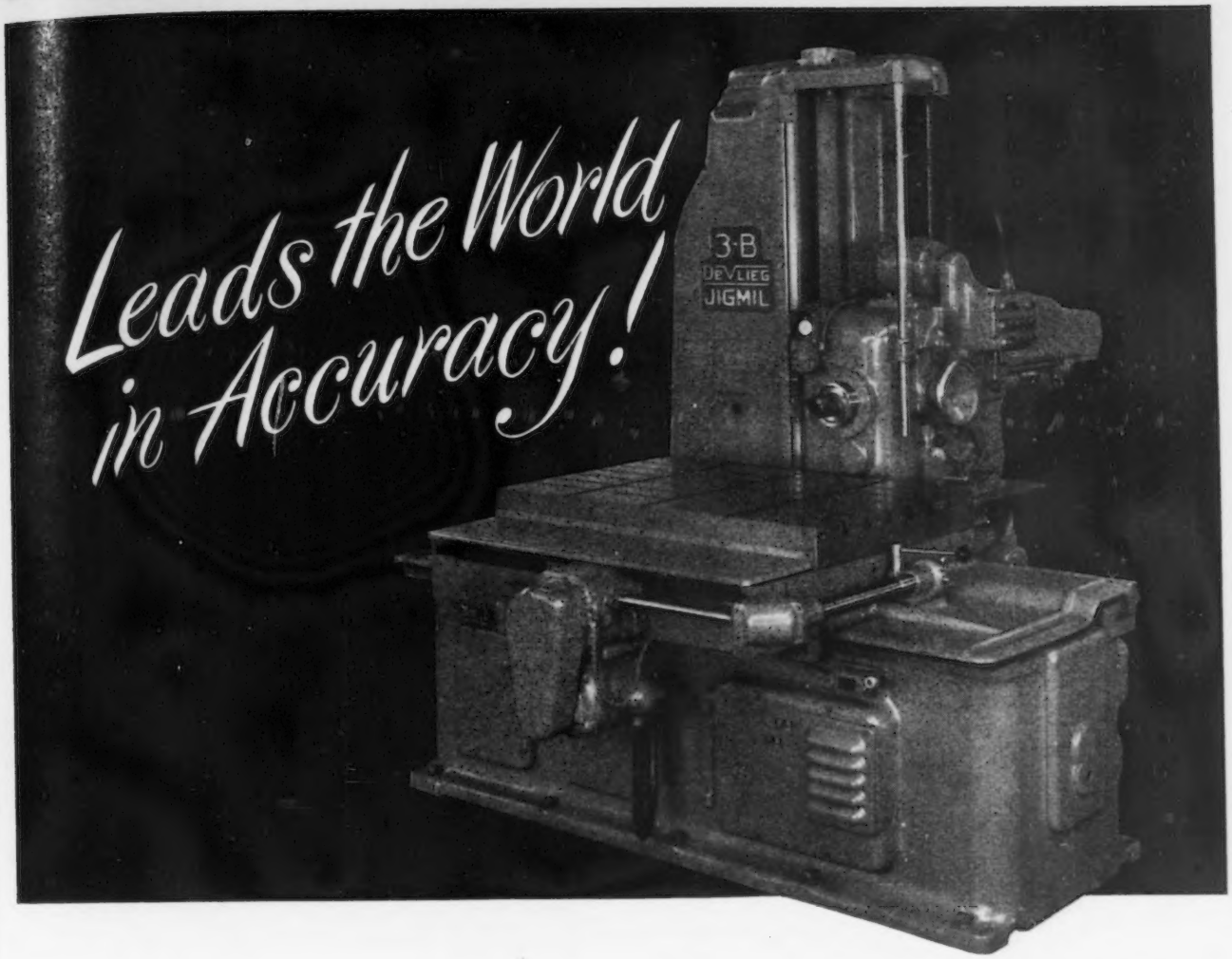
These condtions no longer exist. Britain is dependent on what the United States, in its wisdom and generosity, sees fit to provide. Every target, every program, every statement of economic intention this year, whether at home or abroad, is dependent on what America does to help, and when that help arrives. It is a euphemism to say that, without aid from the United States, Britain would be compelled to cut consumption and employment, and to abandon many of its development plans. The truth is that, on the showing of the Economic Survey itself, Britain cannot dispense with such aid and hope to survive as a modern industrial state or a working social democracy.

TO TALK of 1948 as a year of transition, or the first year of a great upward turn in Euoopean economic recovery, therefore, strikes far too hopeful a note. At the best, this year will go down in history as the year in which the British government and the British people perceived in the nick of time the disgrace of unending subventions from the United States and the threat of impoverishment to the lowest standards of a backward economy. It will be a year, not of progress, but of grim hanging on. On the best assumption, that American aid arrives in time, the British standard of life this year will be appreciably "though not disastrously" lower than in 1947. That is the certain prospect, in real terms, and no illusory increases in money wages or salaries should conceal it.

There are texts for innumerable economic sermons in this omnibus of frank analysis by the government. One vital question, in Britain's present predicament, is the extent to which it can be expected to send goods abroad without receiving an immediate return—the problem of "unrequited exports." Undoubtedly such exports have been unduly encouraged by the generous scale of repayment of sterling blances during the past 15 months. The government intends to limit the volume of such exports in future "to an amount commensurate with the present resources of the United Kingdom." In broad terms, the Survey makes a respectable case for a certain measure of unrequited exports. If there is any ultimate hope for the British economy in its present form, it can only rest on the revival of multilateral trade and the rehabilitation of the shattered economies of Europe and Asia.



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Industrial News Summary...

- **Coal Strike Apathy Misleading**
- **Impact on ERP Could Be Serious**
- **Steel Customers Getting Jittery**

THE current coal strike is far more serious than either the public or the government realizes. The apathy of those who are supposed to be interested in the country's economy is misleading.

Steel firms are holding up output this week in the hope that the coal tieup will not last long. But they are gambling. If they lose it means that in the next few weeks the steel rate will fall rapidly, shipments will be held up and the general hysterical cry for steel will again be raised.

This week there was nothing which indicated that the miners would be back in the pits soon. There has been plenty of talk but no action. Not generally realized is the serious impact a prolonged tieup would have on the Marshal Plan, or on any defense program that may be coming.

Already steel customers who have gone through these coal crises are becoming jittery. It might be called "suffering from Lewis' Disease." The specter of less steel is real to thousands of steel users even though it has not seemed to have been taken seriously by the public and the government.

The tempers of coal operators and Mr. Lewis indicate a bitter tussle. The two sides are as far apart as the poles on the pension question. Furthermore it is only conjecture so far as to what effect an injunction would have on the miners. No one can mine coal but the miners. They will not return to work until John L. Lewis tells them to.

STEEL sales offices in all districts covered by THE IRON AGE show that pressure is on for steel deliveries. It is also clear that there have been no signs of a leveling off in the regular steel market.

Detroit reports that consumer demand is not falling off. Automobile companies insist that car sales are holding up and that the appliance business calls for more and more output. So strong do those sources believe this that they look for no easier steel supply situation for at least 6 months.

A close check of the gray market bears out an IRON AGE report of two weeks ago that the super market has cracked up. Even in the face of anticipated further steel shortages because of the coal strike, high prices prevalent a month ago are out the window.

Gray market sales continue but prices are lower and volume is contracting. The price factor has finally forced steel users who have dabbled in the gray market to look at their cost sheets. What they see has scared them—made them choosey and hard to please.

There are this week no signs that inventories of steel customers are of a size to frighten anyone. In most cases IRON AGE editors find the same refrain—"we could use more and our stocks are not up to what we call normal." Such a condition will be aggravated by the coal loss that has been suffered in the past 10 days.

Since the supply of coke has been a bottleneck to the use of greater steel ingot capacity the coal impasse has threatened for the time being the full use of the industry's capacity.

The steel price publicity has cleared up a confusing situation in the Chicago district. Acme Steel which raised its hot and cold rolled strip prices after it had to pay more for its semifinished steel has knocked out its increases. The company's position was untenable because larger companies were selling at a lower price.

HAD the price fiasco not been aired in the papers it is likely that other steel firms would have raised their cold rolled strip price. Acme must now absorb the increase of about $7 a ton in semifinished steel which it buys from a large integrated mill.

The cold shoulder which the freight car industry and the farm implement people have given the steel voluntary allocation plan is the best news the steel industry has had since its ears have been battered on other matters. But the oil industry will probably hold out for allocations on the basis that they need more steel and have been unable to get their share.

Their attitude and what they finally get from the allocation committee will determine future fireworks in steel supply. If oil and gas get anything near their demands the air will be filled with cries from other users who will enter the fray then and demand their share of available steel. The general "paper" allocation comedy will then be on.

The scrap market this week is poised to react because of the coal strike. If more openhearths go down demand for scrap will be off temporarily. This may force prices lower. At Philadelphia higher prices being paid by brokers have strengthened the quotations there on No. 1 steel. The average price of that grade is up $1.50 there. This has forced up THE IRON AGE scrap price composite to $40.25 a gross ton, an increase of 50¢ a gross ton from a week ago.

The steel ingot rate this week is estimated tentatively at 96.5 pct of capacity. It may be that more openhearths will be taken off late his week. At least half of the steel firms will not seriously reduce operations unless the strike goes into its third week. At that time the decline will hurt.

The coal impasse has overshadowed the coming steel wage talks. By the time steel and labor sit down at the bargaining table around Apr. 6 output may be sagging. But since steel labor has a no-strike clause and because it believes it will get a moderate increase negotiations are expected to last until the eleventh hour. Each side will have voluminous arguments in favor of its stand. But steel labor will not strike this year.

• **ROLLING CARBON SHEETS**—Eastern Stainless Steel Corp., Baltimore, heretofore a producer of stainless steel sheets only, began conversion rolling of hot-rolled carbon steel sheets last week in order to fill out its production schedule. The company is in a position to roll sheets from carbon plates, hot-rolled bands and sheet bars supplied by the customer. Roughing facilities for handling sheet bars are limited, and sheets will be furnished in the unannealed and unpickled condition. Stainless producers who have not been in a position to offer bonus tonnages of carbon sheets have been at a disadvantage in the present competitive stainless market.

• **NEW TRIAL DATE**—Dept. of Justice attorneys have asked the district court, Trenton, N. J., to set a trial date for late May or early June in its price-fixing case against stainless steel producers. After filing in January 1945, a previous trial date, scheduled last September, was postponed pending efforts between the industry and government to effect outside settlement. Such efforts have failed, the government holds, in asking that a new trial date be set.

• **RECORD DEMAND**—Although demand for lightweight electricweld steel tubing in overhead irrigation has climbed steadily during recent years, installations this spring will reach a greatly accelerated pace. One large producer of electricweld tubing reports that production of this item is already breaking all production records. A 20-ft length of 18 gage tube weighs only 60 lb, enabling a farmer to move it to another section easily when the desired water penetration is reached along a strip of field.

• **ORCHIDS TO STEEL**—The steel industry got two bouquets from its customers last week when both farm equipment and railroad car builders turned thumbs down on voluntary allocations under the government's jaundiced eye. These groups said they prefer to go along as they are now. The implication is that while steel company allocations systems have come in for their share of criticism they are preferable by far to anything the government might work out.

• **OK TAFT-HARTLEY ACT**—The Senate-House Labor Committee—so-called congressional watchdog of the Taft-Hartley Act—reported last week that the act thus far has not worked undue hardships upon either employer or employee and that labor problems are being settled "in more friendly and cooperative relationships." Congressional response to the report ranged from high praise to bitter criticism.

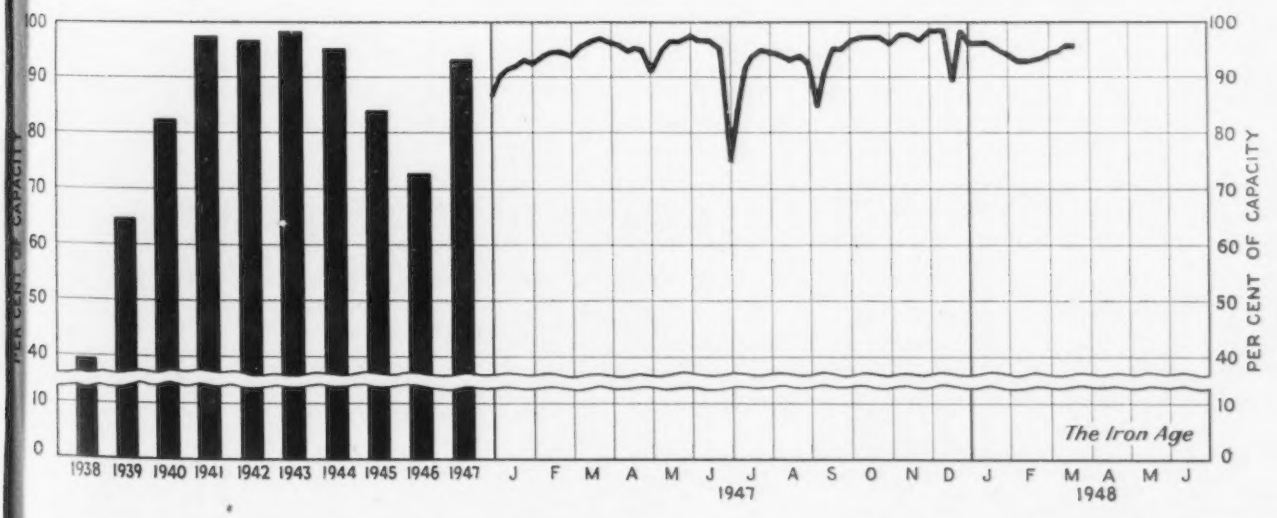
• **WAREHOUSE COMMITTEE**—The Office of Industry Cooperation has asked the steel warehouse industry to form an adviosry committee to discuss the possibility of working out a voluntary allocations agreement which would keep adequate supplies flowing to the warehouses. With an estimated 15 pct of finished steel flowing through warehouse channels, OIC feels that such a program might be necessary in order to assure small business a fair share of limited steel supplies.

• **COAL BIN LOW**—The nation's coal bin is at a dangerously low level, according to the Bureau of Mines. As of Feb. 1, stocks of soft coal and lignite were sufficient to last 29 days. The bureau regards anything less than 30 days as dangerous. March figures will not be available for a few days, but bureau officials say they will probably be lower.

• **BRITISH PRODUCTION**—British steel production has, for the first time, exceeded a rate of 15 million tons per year. The rate of 15,049,000 tons registered in February is well above that needed for the 14 million-ton target, even after allowing for a fall in production during the holiday periods.

• **PRODUCTION FORECAST**—Current high levels in both employment and production in the construction and mining machinery industries may be expected throughout the year, it is forecast by the U. S. Employment Service. The prediction is based on a USES survey which indicates a continued high domestic demand with shortages in some items plus a probable substantial requirement for foreign shipments under ERP.

Steel Ingot Production by Districts and Per Cent of Capacity



of	Pittsburgh	Chicago	Youngstown	Philadelphia	Cleveland	Buffalo	Wheeling	South	Detroit	West	Ohio River	St. Louis	East	Aggregate
48	99.0	94.5	92.0*	90.0	94.0*	106.5*	99.0	102.0	102.0	104.0	100.0	77.5	98.0	97.0
48	97.0	96.0	93.0	90.0	93.0	106.5	99.0	102.0	102.0	100.0	100.0	78.0	98.0	96.5**

ead
ative

MORE STEEL COMING FOR DSC CUSTOMERS

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Improvements at our Detroit Mill to step up that unit's producing capacity to 150,000 tons a year . . . to increase the supply of cold rolled strip available to Midwestern customers by about 35,000 tons a year.

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John L. Takes Play From Phil Murray's Steelworkers' Union

But No-Strike Promise, Steel Price Fiasco Keep Steam Under Union Demands

By TOM CAMPBELL
News-Markets Editor

New York

• • • **When Big Steel and** Phil Murray sit down to argue out wages around Apr. 6, openhearths may be cold. The coal strike will take care of that. But there will be no embarrassment for Mr. Murray because his union is on record that it will not strike—and it won't. It would have looked silly had their plans called for a walkout only to find that John L. Lewis had shut steel down earlier.

This week and for the past several weeks steel and labor have been feeling each other out. So far there have been no big wig meetings on the quiet. They aren't necessary. Each side knows up to this time what is wanted. When things get too hot quick action will be taken—but there is no hurry now.

The fiasco over steel prices played in Mr. Murray's favor. He and his aids will rend the air soon with arguments that steel can afford a wage raise with no increase in prices. He has statements from Democratic and Republican Congressment to support him. He also has a sharp research manager who can slip his slide rule as fast or faster than many steel statisticians —and with less restraint from higher-ups.

In a way the coal crisis—which is getting to be an annual affair—will eventually strengthen steel labor's hand. Any letup in steel demand or easier shipments—if they were on the way—will be blocked. The coal tieup leaves scars months after settlement is made and men return to work. This time the coal strike is on in earnest. But like all of John L's actions anything can happen—it has and will.

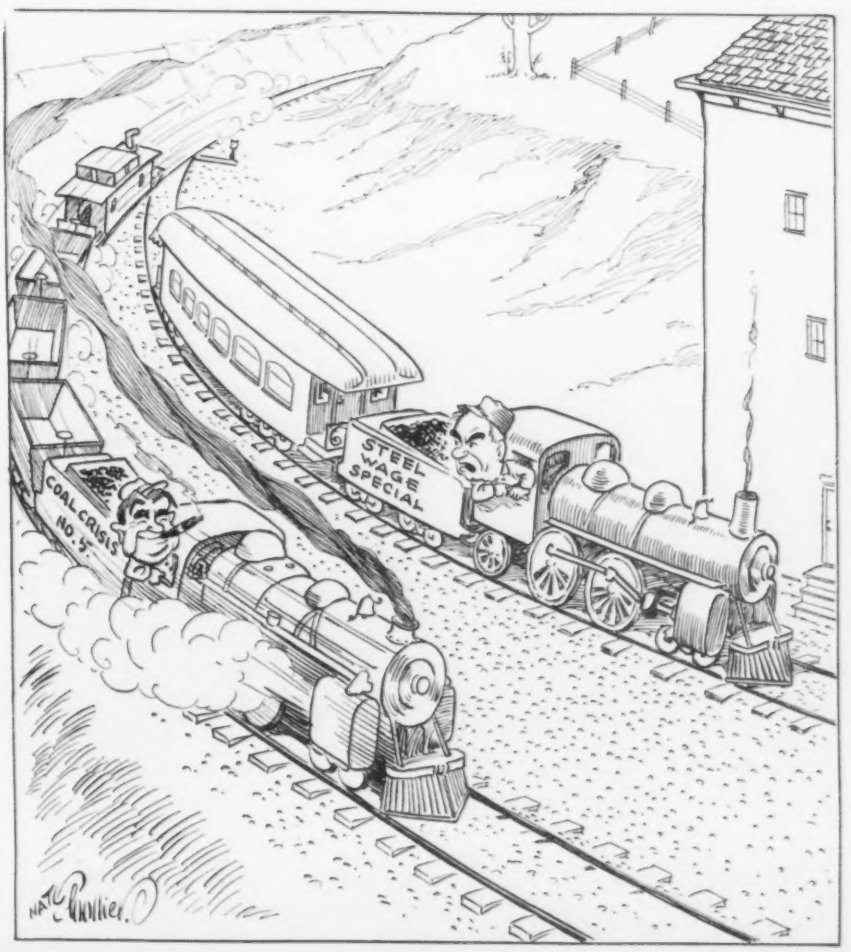
Steel management privately is still reeling from the punches it received at Washington recently. Unfortunately steel leaders were put on the rack for the benefit of the voting public. They got the worst grilling handed out in some time—and it did not help the management side of the wage question.

The editorial savagery which followed the semifinished steel price hike had its roots deeper than that action alone. The steel industry for some reason or other has not sold itself to the working press. Whether it can get over the terrible shellacking it got remains to be seen. If it hopes to, steel firm public relations men must have a chance to use their own judgment and their own i m a g i n a t i o n without the straight jacket that some steel heads place over them.

Many steel officials insist on sticking to their own idea of what the public thinks or what they should be told. Such steel officials are among the last to really know what the man on the street thinks or what makes the working press tick. If they hope to get their case on high costs and high wages across they had better let the men who handle press relations do the job or at least attempt to do it the way it should be done—that is the cold, unemotional viewpoint of top newspaper men today.

Steel management and steel labor get their innings in the daily press. The issues will be clear this year on steel wage demands. Steel companies claim that wage increases are inflationary and nothing is gained by advancing rates. The profit statements will be explained on the basis that today's net income is far below what it ought to

Sidetracked ! ! !



be to protect investment and provide for replacement.

Steel labor will wave aside management claims and point to higher profits. The union will place great stress on the fact that many higher steel prices have been instituted over the past several months. They will say that these increases have so compensated steel firms that a raise can be granted without more price increases.

Then will begin the tug of war. The outcome? It still looks like labor will get a moderate raise and more social security gains. Just how steel will recover the heavier cost is not known. But B. F. Fairless, U. S. Steel head, has said that higher steel costs mean higher prices. No one yet can be jailed for trying to make a profit—even it is a moderate one

Steel Credit Depts. Are Expanding With Much More Activity

Chicago

• • • **Credit departments** of steel producers and warehouses are back in business. They are expanding their forces in preparation for even more activity. The aftermath of credit restrictions following war time inflations are now being felt.

Experts report there is no ground for panic concerning our general financial conditions. The banks are plenty tough on new loans. Many more purchasers of steel and metal are missing discounts than did 6 months ago. Bankers say the extreme caution in loans is a necessary curb, but some small companies needing money accuse the banks of cracking down at the wrong time. Bankers say they should have started long ago.

AMERICAN IRON AND STEEL INSTITUTE

Production of Open Hearth, Bessemer and Electric Steel Ingots and Steel for Castings

YEAR 1948

(Preliminary)

Period	OPEN HEARTH		BESSEMER		ELECTRIC		TOTAL		Calculated weekly production (Net tons)	Number of weeks in month
	Net tons	Percent of capacity	Net tons	Percent of capacity	Net tons	Percent of capacity	Net tons	Percent of capacity		
* January	6,768,497	95.5	343,169	*77.5	361,110	79.0	7,472,776	93.6	1,686,857	4.43
† February	6,246,472	94.3	340,596	82.3	353,585	82.7	6,940,653	93.0	1,676,486	4.14
March										4.43
1st Quarter										*13.00*

YEAR 1947

Period	OPEN HEARTH		BESSEMER		ELECTRIC		TOTAL		Calculated weekly production (Net tons)	Number of weeks in month
	Net tons	Percent of capacity	Net tons	Percent of capacity	Net tons	Percent of capacity	Net tons	Percent of capacity		
January	6,544,841	95.1	384,096	87.7	284,309	65.9	7,213,246	93.0	1,628,272	4.43
February	5,830,371	93.8	314,912	79.6	276,779	71.1	6,422,062	91.7	1,605,515	4.00
March	6,614,369	96.1	378,893	86.5	314,224	72.9	7,307,486	94.3	1,649,545	4.43
1st Quarter	*18,989,581*	*95.0*	*1,077,901*	*84.8*	*875,312*	*69.9*	*20,942,794*	*93.1*	*1,628,522*	*12.86*
April	6,360,600	95.4	375,675	88.6	306,422	73.4	7,042,697	93.8	1,641,654	4.29
May	6,634,716	96.4	372,878	85.2	321,903	74.6	7,329,497	94.5	1,654,514	4.43
June	6,312,674	94.7	351,247	82.8	304,744	73.0	6,968,665	92.8	1,624,397	4.29
2nd Quarter	*19,307,990*	*95.5*	*1,099,800*	*85.5*	*933,069*	*73.7*	*21,340,859*	*93.7*	*1,640,343*	*13.01*
1st 6 Months	*38,297,571*	*95.3*	*2,177,701*	*85.2*	*1,808,381*	*71.8*	*42,283,653*	*93.4*	*1,634,467*	*25.87*
July	6,028,707	87.8	256,125	58.6	285,322	66.3	6,570,154	84.9	1,486,460	4.42
August	6,324,456	91.9	346,033	79.0	311,597	72.2	6,982,086	90.1	1,576,092	4.43
September	6,147,448	92.4	334,425	79.0	306,769	73.6	6,788,642	90.6	1,586,131	4.28
3rd Quarter	*18,500,611*	*90.7*	*936,583*	*72.2*	*903,688*	*70.7*	*20,340,882*	*88.5*	*1,549,191*	*13.13*
9 Months	*56,798,182*	*93.7*	*3,114,284*	*80.8*	*2,712,069*	*71.4*	*62,624,535*	*91.8*	*1,605,757*	*39.00*
October	6,826,543	99.2	384,272	87.8	349,520	81.0	7,560,335	97.5	1,706,622	4.43
November	6,538,179	98.1	360,620	85.0	334,236	80.0	7,233,035	96.3	1,686,022	4.29
December	6,649,666	96.8	373,367	85.5	343,043	79.7	7,366,076	95.2	1,666,533	4.42
4th Quarter	*20,014,388*	*98.0*	*1,118,259*	*86.1*	*1,026,799*	*80.3*	*22,159,446*	*96.4*	*1,686,411*	*13.14*
2nd 6 months	*38,514,999*	*94.4*	*2,054,842*	*79.1*	*1,930,487*	*75.5*	*42,500,328*	*92.5*	*1,617,827*	*26.27*
Total	76,812,570	94.8	4,232,543	82.1	3,738,868	73.7	84,783,981	92.9	1,626,083	52.14

Note—The percentages of capacity operated are calculated on weekly capacities of 1,553,721 net tons open hearth, 98,849 net tons Bessemer and 97,358 net tons electric ingots and steel for castings, total 1,749,928 net tons; based on annual capacities as of January 1, 1947 as follows: Open hearth 81,010,990 net tons, Bessemer 5,154,000 net tons, Electric 5,076,240 net tons, total 91,241,230 net tons.

Lake District Ore Movement Hitting Highest Peacetime Level

Cleveland

• • • **Movement of** 85 million tons of Lake Superior district iron ore this season, highest peacetime tonnage in history, was predicted here this week by qualified sources in the iron ore industry.

Indications are that last year's 77,898,087 gross tons, a peacetime record, must be exceeded by several million tons if the steel industry's requirements are to be met.

Following February consumption of 6,440,586 gross tons by U. S. and Canadian blast furnaces, stocks on hand Mar. 1 at furnaces and Lake Erie docks totaled 22,628,022 gross tons, lowest stocks on Mar. 1 in the records of the Lake Superior Iron Ore Assn.

March consumption has been tentatively estimated at a little less than 7 million gross tons, which will leave stocks on hand totaling about 15 million gross tons Apr. 1.

Consumption during the past five months has been at the rate of about 84 million gross tons per year. It is estimated that new blast furnace capacity to be added this year will require about 3 million gross tons, to carry them up to the opening of navigation in 1949, making a total requirement of 87 million gross tons. Not more than 2 million tons of this is likely to be carried all-rail, unless delay in the opening of navigation makes it imperative in order to avoid furnace shutdowns.

Fortunately, the resolution for Canadian ore carriers to transport ore between U. S. ports was passed by the House Mar. 16. The Senate has already passed the bill and it now awaits only President Truman's signature. In essence, the bill is a temporary suspension of the coastwise shipping laws. The suspension authorized in 1941 in the war emergency expired at the close of last season.

Canadian boats carried about 2,663,000 gross tons of iron ore in 1942. In 1947, the Canadian fleet carried about 473,000 gross tons, and it is understood that Canadian boats could conceivably carry about 3 million gross tons this season. Should this prove to be the case, U. S. carriers will have to move 79 million gross tons, which might keep some of them on the lakes until December. It is also possible that the all-rail movement might continue through the winter in some areas, particularly Chicago, according to informed sources.

New Soaring Consumption Rate Leaves March Stockpiles Lowest on Record

By W. A. LLOYD
Cleveland Regional Editor

On the basis of current consumption, it has been estimated that about 2 months supply of iron ore will be on hand at furnaces and Lake Erie docks Apr. 1. During April more iron ore will be consumed than will be added to the stockpiles, which means that May 1 inventories will be very low, even though shipping gets an early start.

Extending this a bit further, in the event the Great Lakes fleet brings 85 million tons down to lower lake ports this season and consumption continues at approximately the same rate, stockpiles on Apr. 1, 1949, will be even lower than this year.

Normally, the lake season opens early in April, but ice, wind and weather permitting, operators will start operations in March in an effort to meet the heavy schedules ahead.

The Coast Guard's ice breaker, Mackinaw opened up the Buffalo Harbor for a small fleet of lake freighters Mar. 17 and is now proceeding to the Straits of Mackinac for more difficult ice breaking duties.

Fleet appointments have been out for several weeks and fit out crews have been going aboard to place vessels in readiness and get up steam. Shore meetings with captains and chief engineers are in session and the 270 ore carriers comprising the U. S. fleet are ready to go.

While the accent will be on iron ore, coal is the primary up-bound cargo and in both coal and limestone, which set new peacetime records in 1947, tonnages are likely to be equaled or exceeded.

Industry Groups Oppose U. S. Allocation of Steel

Washington

• • • **Washington's voluntary steel** allocation plan ran into rough waters last week at its first public hearing. An Office of Industry Cooperation move to take over the freight car building program from the Office of Defense Transportation ran into outright opposition from the carbuilders. Several big railroads also opposed any change. Government inteference and additional reporting requirements were cited as reasons for not upsetting the year-old ODT program.

R. L. Glenn, ODT official, threw another monkey wrench into OIC's proposal when he told the assembly that foundries appear to be getting enough pig iron to take care of the program and saw no need for the allocations sought by OIC. He was seconded by a spokesman for the gray iron and the malleable foundries. Earlier in the week the farm equipment industry had turned thumbs down on participation in a government sponsored allocations program.

Army Selling Scrap

Washington

• • • **Bids on** 75,000 tons of ferrous scrap and 5000 tons of secondary aluminum ingots will be opened May 10 in Heidelberg, Germany, by the U. S. Army.

All material sold under bidding must be returned to the U. S. for use in the domestic economy. No bid will be considered which does not contemplate this action, the Army said.

Industrial Briefs . . .

• WESTERN OUTLET — Warner & Swasey Co., Cleveland, has opened a new Los Angeles showroom, warehouse, and western sales headquarters at 3340 Leonis Blvd. in Vernon. L. R. Hawkins is in charge of the new headquarters.

• NEW PLANT — Homestead Valve Mgr. Co., Coraopolis, Pa., climaxed its $400,000 postwar expansion by formally opening its new Hypressure Jenny steam cleaner plant. The new unit has over 1000 ft of conveyers and a motorized assembly line.

• FOUNDATION DIRECTOR —Dr. Haldon A. Leedy has been named cating director of Armour Research Foundation of Illinois Institute of Technology, Chicago. He succeeds Dr. Jesse E. Hobson who resigned as director of the foundation to become executive director of the Stanford Research Institute at Leland Stanford University, Palo Alto, Calif. Dr. Leedy has been associated with the foundation since 1938, and has been chairman of Physics Research since 1944.

• OPEN HOUSE — Some 350 purchasing agents of Illinois, Indiana, and Wisconsin attended the Kropp Forge Co. open house held recently at the Chicago plant.

• INCREASES CAPACITY — McLouth Steel Corp., Detroit, has purchased a 24-in. cold rolling mill to be installed during the third quarter of this year.

• MOVES — Diamond Alkali Co. has moved its general offices from Pittsburgh to Union Commerce Bldg., 925 Euclid Ave., Cleveland 14.

• DISTRIBUTION SETUP — National distribution of boring tools manufactured by the Criterion Machine Works, Beverly Hills, Calif., is now being handled by the Wendt-Sonis Co., Hannibal Mo.

• ACQUISITION — The Fuller Mfg. Co., Kalamazoo, Mich., manufacturer of heavy-duty unit-mounted and auxiliary transmissions, has purchased the complete facilities of the Reed Foundry & Machine Co., Kalamazoo. The foundry will will provide an estimated capacity of 15 tons of gray iron castings per day.

• MANAGEMENT UNIT — A local management unit of Gray Iron Founders' Society has been organized at Minneapolis. J. E. Quest, J. F. Quest Foundry Co., Minneapolis, was elected chairman.

• WESTERN BUY — National Electric Products Corp., Pittsburgh, has purchased the Torrance, Calif., plant of Joshua Hendy Iron Works. National Electric will equip the plant for manufacture of flexible electrical conduit, tubing and electrical fittings. Production is slated to start in September.

• FOREIGN SUBSIDIARIES —Two foreign manufacturing subsidiaries have been formed by the Monroe Auto Equipment Co., Monroe Mich. Monroe-Acme, Ltd., Toronto, was established by Monroe and the Canadian-Acme Screw & Gear, Ltd., Toronto, and Woodhead-Monroe Ltd., Leeds, England, formed by Monroe and Woodhead Components, Ltd.

• AWARDS CONTRACT — The Permanente Metals Corp., Oakland, Calif., has awarded contracts to the United Engineering & Foundry Co., Pittsburgh, for the construction of machinery for a rod and bar mill to be located in Spokane.

• $10 MILLION PROGRAM— The Southern Alkali Corp., and the H. K. Ferguson Co. have announced the completion of a more than $10 million program at Lake Charles, La., which converted a war surplus magnesium chloride plant into chlorine and caustic soda plants.

U. S. Steel's 1947 Report Details Its Rising Costs

New York

• • • **Higher replacement** costs must be charged to the cost of doing business to avoid overstating profits and dissipating capital, according to Enders M. Voorhees, chairman finance committee, U. S. Steel Corp. of Delaware. Mr. Voorhees, in the financial summary of the corporation's annual report issued Mar. 24, listed sharp cost increases in supplies since 1940.

At the end of 1947 scrap was 93 pct over the 1940 average, fuel oil was up 130 pct; coke 111 pct and tin 96 pct. In 1947, he said, products and services bought accounted for 42 pct. of U. S. Steel's total costs.

Wages, salaries and other employment expense were 45 pct of total costs. Average hourly earnings were 29 pct above the 1940 level during the 5 war years. For 1947 this figure averaged 73 pct but finished the year 80 pct above the 1940 average.

The report also detailed some sharp increases in construction and equipment costs. A wire drawing machine cost 91 pct more in 1947 than it did in 1940, Mr. Voorhees pointed out. Concrete construction costs rose 124 pct while brick construction zoomed 250 pct in the period. Ather increases during that time were given: Standard electric crane 105 pct; blast furnace 105 pct; byproduct coke ovens 150 pct and a continuous rolling mill 84 pct. Among smaller cost jumps were mine locomotives 44 pct, and large electric motors 50 pct.

Other sections of the report showed a $60 million reduction in working capital. Remaining for reinvestment in the business after dividends was $56.2 million at the end of 1947 as compared with $28.6 million in the poorer year 1946.

Reports Net Earnings

New York

• • • **Operations of** the E. W. Bliss Co. for 1947 resulted in net earnings of $2,285,274, according to Marshall M. Smith, president. This is equivalent to $6.67 per share of common stock, as compared with $4.06 for the year 1946.

Weekly Gallup Polls . . .

Voters Favor Strengthening UN by Charter Revision

Princeton, N. J.

• • • **More than six** out of ten American voters today favor a rewriting of the United Nations charter to make the organization a stronger force for peace, according to George Gallup, director, American Institute of Public Opinion.

Harold E. Stassen, contender for the Republican presidential nomination, has recommended that a convention of nations be held in 1950 to amend and rewrite the charter. He said a major objective would be the elimination of the single nation veto.

An institute survey recently asked this question of representative voters in all sections of the country:

"It has been suggested that a world convention of the United Nations be called in 1950 to amend and rewrite the UN Charter to make it a stronger organization. Do you approve or disapprove of this idea?"

The answers:

	Pct
Hold convention	63
Don't hold convention	13
No opinion	24

Previous surveys conducted by the institute and its foreign affiliates have revealed a growing dissatisfaction with the progress of United Nations to date. However, despite their lack of enthusiasm over accomplishments this far, people both here and abroad show no sign of wanting to go backward by discarding the organization; instead they want to go forward and strengthen UN even to the point of making it in effect a world government.

Mr. Stassen's suggestion for a world convention is approved by almost eight out of ten American voters with a college education. Although proportionately fewer votes with less formal training approve the idea, the difference is accounted for by indecision rather than disapproval..

Geographically, there is considerable unanimity in voter opinion on the suggestion, with only the Western states giving it less support than the national average.

Main reasons in voters' minds for approving a convention are: UN should be made stronger; revision will be necessary by 1950; UN should be strong because of Russia's attitude; and veto power should be eliminated.

Those opposing a convention in 1950 say: The charter should be adhered to as it is; another meeting won't accomplish much; and a meeting should be held before 1950.

Mr. Stassen's recommendation has not been commented upon by Administration officials. The American Assn. for the United Nations this winter declared that it is not possible now to fix a date for a constitution to consider Charter revision. Problems facing the UN are not constitutional, according to the association, but political.

•

• • • **Even before the** Communist coup in Czechoslovakia, French public opinion was uneasy and apprehensive over the danger of Communists in France

A poll by the French Institute of Public Opinion sounded French opinion as to the relative danger to France of the Communists, the De Gaullists and the new "third force." The third force is an informal coalition of Socialists, members of the MRP party and other moderates formed in January to combat both the Communists on the Left and the De Gaullists on the Right.

The vote in the poll, which was taken just before the Czech crisis, follows:

"In your opinion which is the greatest political danger to France at the present time — the Communists, Gaullists or the third force?"

	Pct
Communists	56
De Gaulle	19
Both	2
Third force	3
No opinion	20

French Public Uneasy Over Communist Danger in France Even Before Czech Crisis

o o o

In the wake of Czechoslovakia some American political observers have put both France and Italy down as possible next victims of Communist expansion.

In France one of the chief obstacles to the spread of Communism is the women. Of all the political parties in France, the Communists have by far the fewest proportion of women in their ranks.

The political make-up of the French parties by sex is shown in recent surveys by the French Institute. In the MRP party 52 pct of the members are women, 48 pct men. In the Gaullist party the division is 50-50 as between men and women. The Socialists ranks comprise 58 pct of men and 42 pct women. The total electorate shows a preponderance of women — 55 pct women, 45 men.

But in the Communist Party the ratio is heavily in favor of men. Sixty-eight percent of the Communists are men, only 32 pct women. Women clearly seem less attracted than men by the doctrines and techniques of Moscow.

•

Would Russia start a war to get something she wanted, or would she fight only in self-defense? That question was put to the voters of France in early February — and seven other nations in one of the Gallup Poll's regular monthly international surveys.

The French result was:

	Pct
Russia would fight war of aggression	51
Would fight in defense only	22
No opinion	27

Construction Steel . . .

• • • **Fabricated steel awards** in recent weeks included the following:

5450 **Tons,** Chesapeake City, Md., Chesapeake & Delaware canal bridge through U. S. Engineers, to American Bridge Co., Pittsburgh.

2300 **Tons,** Graham Station, W. Va., power plant extension, through Appalachian Electric Power Co. to American Bridge Co., Pittsburgh.

1520 **Tons,** Hugoton, Kan., towers, to Mosher Steel Co., Houston.

1345 **Tons,** Tarrant County, Tex., urban expressway, to American Bridge Co., Pittsburgh.

1300 **Tons,** Dresden, N. Y., power plant addition, through Gilbert Associates, Inc., to American Bridge Co., Pittsburgh.

1040 **Tons,** Chester, Va., power plant, to Bethlehem Fabricators, Bethlehem.

780 **Tons,** Indianapolis, Michigan Ave. Bridge through U. S. Engineers, Smith & Johnson Co., to Bethlehem Steel Co., Bethlehem.

780 **Tons,** Thayer Junction, Wyo., two bridges for Union Pacific R.R., to American Bridge Co., Pittsburgh.

725 **Tons,** Detroit, stock house addition, to Whitehead & Kales, Detroit.

650 **Tons,** McCurtain County, Okla., Mountain Fork River Bridge, to Capitol Iron Works Co., Topeka, Kan.

470 **Tons,** Port Jefferson, N. Y., power plant addition, to Harris Structural Steel Co., New York.

445 **Tons,** Chicago, building addition, through L. J. Graf Construction Co., to American Bridge Co., Pittsburgh.

350 **Tons,** St. Louis, track scale material, through Eagle Iron Works to American Bridge Co., Pittsburgh.

345 **Tons,** Washington, administration building, to Bethlehem Steel Corp., Bethlehem.

320 **Tons,** Wilbur, W. Va., Bridge No. 01, through Mt. Vernon Bridge Co. to American Bridge Co., Pittsburgh.

320 **Tons,** Queens, apartment house at 99th St., 65th Ave. and 65th Rd., through Revere Hall, Inc., to Grand Iron Works, New York.

305 **Tons,** Yakima, Wash., penstock specification 2066 U. S. Engineers to American Pipe & Construction Co., Los Angeles.

300 **Tons,** Oral, S. D., specification 1983 five 50-ft gates, U. S. Bureau of Reclamation, dam project to Virginia Bridge Co., Roanoke, Va.

290 **Tons,** Pulga, Calif., Cresta power house, to Herrick Iron Works, Oakland, Calif.

280 **Tons,** Perth Amboy, N. J., alterations, warehouse building, through Raritan Properties, Inc., to American Bridge Co., Pittsburgh.

280 **Tons,** Bellerose, N. Y., addition to P. S. 133, to Grand Iron Works, New York.

265 **Tons,** Flushing, N. Y., Abramson's Dept. Store, warehouse, to Grand Iron Works, New York.

225 **Tons,** Odair, Wash., specification 2050, bulk head, U. S. Bureau of Reclamation, dam project to Gunderson Engineering Corp.

200 **Tons,** Panama City, Fla., diesel locomotive shop for Atlanta & St. Andrews Bay Ry., to Ingalls Iron Works Co., Birmingham.

195 **Tons,** Forest Hills, N. Y., apartment house at Yellowstone Blvd., to Grand Iron Works, New York.

175 **Tons,** Queens, addition to general storehouse for Dept. of Public Works at Vernon Blvd., general contractor, Grove, Shepherd, Wilson & Kruge, Inc., New York, to Grand Iron Works, New York.

175 **Tons,** Jackson, Miss., boiler supports, to Jones & Laughlin Steel Corp., Pittsburgh.

160 **Tons,** Danville, Va., Brantley steam station, to Phoenix Bridge Co., Phoenixville, Pa.

150 **Tons,** Reading, Calif., bus structure, specification 2034 U. S. Bureau of Reclamation project to Bethlehem Steel Co., Bethlehem.

140 **Tons,** Wild Spur, Col., discharge pipe specification 2095 U. S. Bureau of Reclamation project to Southwest Welding & Mfg. Co., Alhambra, Calif.

110 **Tons,** New York, addition to office building at John St., to Grand Iron Works.

100 **Tons,** Jackson, Miss., State laboratory building, to Bethlehem Steel Co., Bethlehem.

100 **Tons,** Miami, Fla., Deserator building, through Ebasco Services, Inc. to Virginia Bridge Co., Roanoke, Va.

• • • **Fabricated steel inquiries** in recent weeks included the following:

700 **Tons,** Whiteside County, Ill., bridge section F, Bethlehem Steel Co., low bidder.

660 **Tons,** Winnebago County, Ill., bridge section 42-F, American Bridge Co., low bidder.

525 **Tons,** Los Angeles County, Calif., steel bridge across San Gabriel River, near Azusa, California Div. of Highways, Los Angeles, bids to Apr. 1.

250 **Tons,** Fayette County, Ill., bridge section 42F, American Bridge Co., low bidder.

240 **Tons,** State of Illinois, two Illinois State Hospitals, Henry C. Gremp, contractor.

115 **Tons,** Mendocino County, Calif., steel bridge, Forsyth Creek, California Div. of Highways, Sacramento, bids to Apr. 7.

• • • **Reinforcing bar awards** in recent weeks included the following:

3000 **Tons,** DuPage County, Ill., Argonne Project for Atomic Energy Commission, awarded 1500 tons to Carnegie-Illinois Steel, 1000 tons to Truscon Steel, 500 tons to J. T. Ryerson & Son.

2200 **Tons,** Whiting, Ind., barrel house for Standard Oil of Ind. through Foster-Wheeler Corp., to Carnegie-Illinois Steel Corp., Pittsburgh.

1200 **Tons,** Montezuma, Ind., state highway bridge for State of Indiana to Bethlehem Steel Co., Bethlehem, Pa.

195 **Tons,** Franklin Park, Ill., factory building for A. G. Fisher & Co., through Stade Construction Co., to Wendnagle & Co., Chicago.

175 **Tons,** Indianapolis, Michigan Ave. bridge through Smith & Johnson Co. to Bethlehem Steel Co., Bethlehem.

• • • **Reinforcing bar inquiries** in recent weeks included the following:

8500 **Tons,** Coram, Mont., Hungry Horse Dam through U. S. Engineer, bids due Apr. 1.

410 **Tons,** Chicago, warehouse for William Wrigley Co., Ragner-Benson Co., Chicago, low bidder.

340 **Tons,** Bald Hill, N. D., dam, U. S. Engineers, Al Johnson Construction Co., Minneapolis, low bidder.

150 **Tons,** Alameda County, Calif., bridge bridge over Alameda Creek near Niles, County Clerk, Oakland, bids to Mar. 25.

120 **Tons,** Riverside County, Calif., grading and bridge between Corona and 0.5 miles east, California Div. of Highways, Los Angeles, bids to Mar. 25.

• • • **Piling awards** in recent weeks included the following:

105 **Tons,** Chicago, Fifth St. Station, Coffer Dam, throgh Paschen Construction, Inc., to Carnegie-Illinois Steel Corp., Pittsburgh.

Coming Events

Apr. 5-8 National Assn. of Corrosion Engineers, conference and exhibition, St. Louis.

Apr. 5-8 Southern Machinery and Metals Exposition, Atlanta.

Apr. 7-9 American Society of Civil Engineers, meeting, Pittsburgh.

Apr. 8-9 National Machine Tool Builders Assn., meeting, Chicago.

Apr. 12-14 Openhearth Steel Committee and Coke Oven, Blast Furnace and Raw Materials Committee, AIME, annual conference, Pittsburgh.

Apr. 15-16 Metal Powder Assn., annual meeting and exhibit, Chicago.

Apr. 15-16 Zinc Institute, annual meeting, St. Louis.

Apr. 19 Wire Reinforcement Institute, annual meeting, Edgewater Park, Miss.

Apr. 19-21 American Society of Lubrication Engineers, convention and exhibition, Buffalo.

Apr. 19-23 American Chemical Society, national meeting, Chicago.

Apr. 20 Steel Joist Institute, annual meeting, Edgewater Park, Miss.

Apr. 21 American Iron & Steel Institute Committee on Researches in Reinforced Concrete, annual meeting, Edgewater Park, Miss.

Apr. 22-23 Westinghouse Electric Corp., Machine Tool Forum, Buffalo.

Apr. 22-24 Concrete Reinforcing Steel Institute, annual meeting, Edgewater Park, Miss.

Apr. 26-28 American Supply & Machinery Manufacturers Assn., National Supply & Machinery Distributors Assn., Southern Supply & Machinery Distributors Assn., Triple Mill Supply convention, Atlantic City.

May 3-7 American Foundrymen's Assn., convention and show, Philadelphia.

May 11-12 American Steel Warehouse Assn., annual meeting, Chicago.

May 26-27 American Iron & Steel Institute, meeting, New York (restricted to members only).

May 27-29 Society for Experimental Stress Analysis, meeting, Pittsburgh.

Will Build Utah Refinery

New York

• • • **Higher freight** costs, coupled with a growing demand for copper from midwestern mills, has caused the Kennecott Copper Corp. to project the construction of a 12,000 ton per month refinery adjacent to its Garfield, Utah open pit mines. E. T. Stannard, president, has reported to stockholders.

Reports of Available Foreign Scrap Are Considered Misleading

New York

• • • **Recent headlines** telling of 10 to 15 million tons of available German scrap have been misleading. It isn't nearly as easy to pry loose scrap from foreign sources as many people would like to believe.

One major steel company is now using its vast organization to explore the far corners of the world in search of scrap with which to feed hungry domestic furnaces. After more than 3 weeks of energetic seeking, they have nothing to report in the way of available scrap, possibilities, offers or anything which could be put in contract form. In their fruitless search, they have combed Europe (including Germany) Egypt and North Africa, the islands of the Pacific and the Orient.

After enduring effusive and glowing accounts by some extra-curricular American emmissaries of the vast resources and production of the United States, it is hard for Europeans to understand why it is so difficult for the U. S. to meet Europe's needs for raw materials and steel products. It is doubly hard for them to understand why the U. S. is vitally interested in obtaining scrap from European sources.

Along with coke and pig iron, scrap is a bottleneck in the steel producing plans of most European countries. One reason for this is that many of the European openhearth furnaces are being charged with much higher percentages of scrap than has been customary in the past. Openhearths in Germany have recently been charged with as much as 80 pct scrap and only 20 pct pig iron.

In their grim struggle to increase steel production European — like American — steelmakers have turned more and more to increased charges of scrap in their openhearths. Here are some of the reasons:

(1) Scrap has been used as a substitute for pig iron, normal supply of which has been drastically curtailed by raw material and transportation shortages.

Scrap Purchasing Missions Throughout World Meet With No Success

By BILL PACKARD
Associate Editor

(2) It takes about 3¾ tons of iron ore, coal, limestone and other materials to make a ton of pig iron. The use of a ton of local scrap in place of a ton of pig iron saves 3¾ tons of short shipping space, in addition to the valuable raw materials.

(3) Use of steel scrap in the furnace cuts steelmaking time, since steel scrap has already been refined at least once.

(4) Fuel is saved by increasing scrap charges in openhearths and thus cutting melting time.

In this country much has been said and written about the necessity of obtaining scrap from foreign sources to plug the gap in our ruptured domestic scrap cycle. But so far not much overseas scrap has actually been obtained.

Much publicity has attended the movement of the now famous Canterbury (Army) scrap (147,000 tons) from Europe, which was collected and shipped from Italy. Delivery of large tonnages on Bethlehem's million-ton Chinese order is still in the prospective stage.

The report of the recently returned government-industry scrap mission represented an honest appraisal of German's scrap resources. But the qualifying statements which follow are as important, if not more so, than the statement which was exploited by some of the press.

Here are some of the qualifications attending possible recovery of the 10 million tons of potential German scrap: (1) Only 2/3 of the scrap is reported in readily accessible locations, (2) It is often difficult to locate the owner of the scrap, (3) It is more difficult to induce the owner to sell it, (4) German scrap owners do not wish to sell scrap at frozen 1936 prices (about $7 to $8 per ton), nor do they wish to be paid in nearly valuless reichsmarks, (5) Equipment and manpower are short, (6) German scrap workers are not classed as priority labor, which receives a hot meal on the job each day, and (7) U. S. State Dept. is expected to vigorously oppose any move to requisition civillian-owned German scrap.

Even if all the above impediments could be overcome, the United States would have to vie with other European nations, who have long had a covetous eye for German scrap with which to feed their own steel industries.

No doubt, from time to time, some scrap will be obtained from foreign sources. But it will not be obtained in as large quantities or as easily as some people have been led to believe.

Rebuilds Three Furnaces And Doubles Capacity

Pittsburgh

• • • **Three slab reheating** furnaces at Carnegie-Illinois Steel Corp. Irvin Works here are being rebuilt by Rust Furnace Co. The work will increase by 50 pct the steel-making capacity of these furnaces.

The rebuilt furnaces will supplement a new 115 ton triple-fired, one-controlled billet heater designed and installed last year by the same contractor. When completed, the billet heating capacity of the rebuilt furnaces, together with the new unit, will total more than 450 tons.

The three furnaces being modernized were built by Rust originally, and put in operation in 1938. During the war they were operated at a maximum of 90 tons per hr, 50 pct above design capacity. The redesign permits larger heat input, and includes modern improvements that increase the capacity of each to 115 tons.

MACHINE TOOLS

. . . News and Market Activities

Builders Find WAA Still in Full Swing Despite JANMAT Program

• • • Machine tool builders and dealers were amazed to discover last week that War Assets Administration, despite the JANMAT program and numerous reductions in regional personnel, was still doing business, and at the same old stand.

In a general letter (No. 155 revision 2) to zone administrators and regional directors, Jess Larson, WAA chief, outlined a new program for the disposal of surplus machine tools predicated upon the development of firm inventories.

According to Mr. Larson's letter, which is of sufficient scope to be considered a brochure, for disposal purposes, the inventory of machine tools and equipment falls into three categories: Machine tools and equipment which need not be listed for submission to JANMAT for selection; machine tools and equipment which must be listed for submission to JANMAT for selection; and machine tools and equipment frozen or tagged by JANMAT but released by the JANMAT committee on specific request.

Methods of disposal to be used for each of these categories are as follows: General purpose and special machine tools and equipment below 0-4 conditions; all machine tools and equipment manufactured in 1921 or any year prior thereto and not rebuilt since 1921; and all other machine tools and equipment which need not be submitted to JANMAT are to be offered by spot bid or auction. At each sale the machine tools and equipment will be offered first as individual tools and then in lots. Priority rights will be recognized. Any residue may be disposed of by any available method, including negotiation.

General purpose and special machine tools and equipment in 0-4 condition and above (except overage), will be offered first to JANMAT and then by competitive bid method, including spot bid, sealed bid or auction, as individual tools. Priority rights will be recognized. In a spot bid or auction sale, these machine tools will be offered in lots immediately after offering as individual tools. Residue will be disposed of by any available method, including negotiation.

Proposed Method of Pricing May Cause Loss of New Machine Tool Sales

o o o

Machine tools and equipment tagged by JANMAT but released by the JANMAT Committee on specific request will be offered to the requestor who obtained the release at prices based on acquisition cost applied to condition certified by the inspection division as follows:

Condition of tool released by JANMAT Committee, and fixed pct of acquisition cost

N-1	90
N-2	85
N-3 and/or 0-1	80
0-2	70
0-3	60

Machine tools and equipment not accepted by JANMAT shall be offered for competitive bid in accordance with the procedure for disposal for tools in 0-4 conditions and above.

Machine tools and equipment not purchased by the person obtaining the release shall be returned to JANMAT.

Mr. Larson's letter has produced a minor rhubarb in the trade, including the charge that the only people who will profit by the new method of pricing are those who bought for stock and are still holding them. It is also alleged that the new prices are just enough below those of new machine tools of the same type and make to cause considerable hesitancy if not the outright loss of a new machine tool sale. It is further alleged that some of these machines were being sold just above scrap prices not so long ago. The 17½ pct discount, apparently, is gone forever.

Other developments in the wind, however, particularly the rearmament program, will undoubtedly cause WAA's action to be quickly forgotten, with rumors of $100 million jet programs running around the ASTE show in Cleveland.

February was a dull month in most major machine tool sectors, according to those who should know, and while March has looked a little better to date, it is not expected to be as good as January. The industry seems to be running through a pretty dry period, which, according to some observes, will pretty well defy analysis until May. Some companies, however, hope to be able to report a better first quarter than last year, largely as the result of January business.

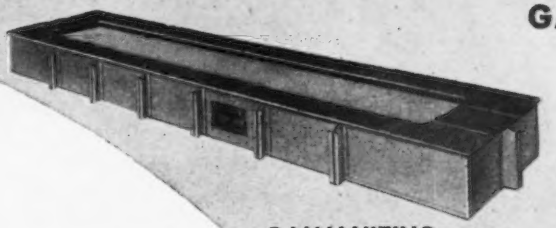
A good deal of foreign business has been held up, pending licenses and other things, including a lot of equipment for Czechoslovakia. The report was out last week that one of Russia's principal objects in the Czech-grab was that country's industrial capacity and the skills that go with it.

Outlook for the second quarter following President Truman's speech is that business will go into the rearmament program pretty fast, and buyers who were waiting for fall and possible softness in price will come in right away.

In Detroit the mass migration of tool engineers to the Cleveland show finds the machine tool industry quiet but optimistic. New business volume is reported close to normal for many segments of the industry. The materials supply situation, particularly iron castings, is reported somewhat improved. Despite virtual completion of the new Ford and GM die programs, Detroit tool and die shops are well filled with Chrysler and out-of-town work, according to industry sources.

THERE IS A SUNBEAM STEWART INDUSTRIAL FURNACE FOR EVERY NEED

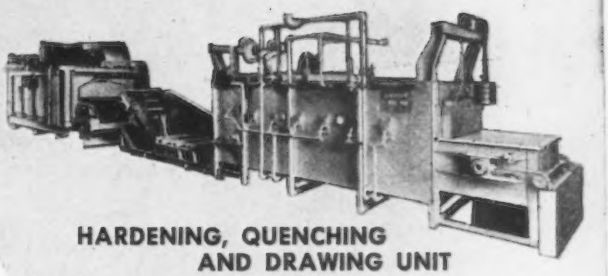
GAS • ELECTRIC • OIL



GALVANIZING

Sunbeam STEWART

THE BEST INDUSTRIAL FURNACES MADE



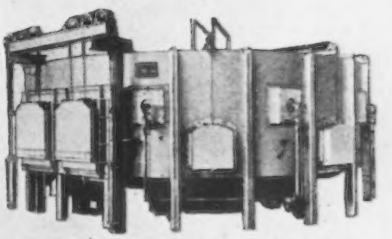
HARDENING, QUENCHING AND DRAWING UNIT

- ***Longer* furnace life** • ***Greater* production**
- ***Lower* operating cost**

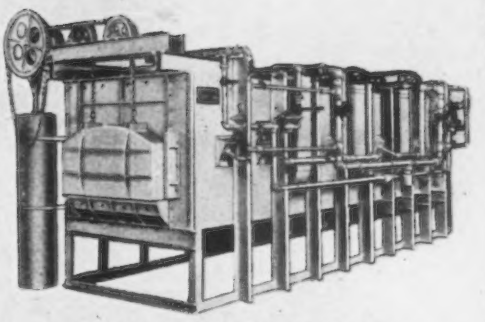
As a division of Sunbeam Corporation we have the opportunity of working with our furnaces in the production of Sunbeam appliances, lawn sprinklers, sheep shears, animal clippers, etc. In manufacturing our own products we must contend with practically every heat treating problem faced by industry —a position unique in the furnace manufacturing field.

This experience with our own furnaces in large volume production enables us to render a service to you far beyond other manufacturers. That is one reason why Sunbeam Stewart Furnace installations have been so successful. They are based not only on furnace engineering ability, but on practical experience under actual operating conditions. We have learned through actual experience the factors that give longest furnace life . . . greatest production . . . best quality . . . and lowest operating cost.

Our highly trained technical staff of furnace engineers who for over 50 years have built furnaces for the leading companies throughout the United States and abroad are qualified to recommend the correct type of furnace to meet your requirements.

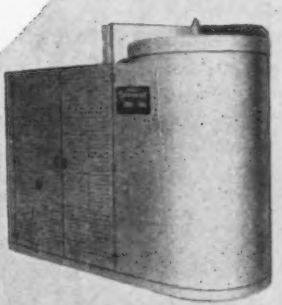


ROTARY HEARTH FORGE

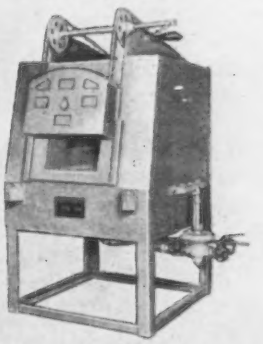


PORTABLE OVEN FURNACE

A letter, wire or 'phone call will promptly bring you information and details on Sunbeam Stewart Furnaces, either units for which plans are now ready or units especially designed to meet your needs. Or, if you prefer, a Sunbeam Stewart engineer will be glad to call and discuss your heat treating problem.



RECIRCULATING FURNACES



SEMI-MUFFLE AND FULL MUFFLE OVENS

SUNBEAM STEWART INDUSTRIAL FURNACE DIVISION of SUNBEAM CORPORATION

(Formerly CHICAGO FLEXIBLE SHAFT CO.)

Main Office: Dept. 110, 4433 Ogden Ave., Chicago 23 — *New York Office:* 11 W. 42nd St., New York 18 — *Detroit Office:* 308 Boulevard Bldg., Detroit

Canada Factory: 321 Weston Rd., So., Toronto 9

NONFERROUS METALS

. . . News and Market Activities

Magnesium Meet Discloses New High Strength Alloys

New York

• • • **The Magnesium industry** is buzzing with the news of the newly developed series of alloys whose yield strength in tension and compression was reported to approximate 74,000 psi by Lt. Gen. R. A. Wheeler, Chief of Engineers, Dept. of the Army, at the fourth annual meeting of the Magnesium Assn. last week. These alloys, reported by General Wheeler to have been produced in experimental quantities, have been found suitable for forging, rolling, extruding and welding.

If borne out in commercial production, these alloys promise to promote the use of magnesium for applications requiring greater strength and toughness than possible at present. In comparison with the reported yield strength of 74,000 psi, present magnesium forging alloys have a yield of only 35,000 psi. The high strength aluminum alloy, 75S, has a yield of only 65,000 psi.

According to General Wheeler, who did not reveal the composition of the new alloys, they can be cold-worked. They can be rolled in any direction and at lower temperatures. They can be extruded at a rate several times faster then present comercial alloys. They can be reduced in area by 66 pct in one pass, as compared to a present commercial maximum of only 10 pct. At present it does not appear that these alloys will require any significant changes in manufacturing and fabricating techniques.

The specific gravity of the new magnesium alloys were reported to have been lowered to 1.5, as compared with 1.7 for commercial alloys. In speculating on the composition of the alloys industry members considering the lighter metals that may be involved have come up with the conclusion that it must be beryllium.

General Wheeler observes that, while developed primarily for military applications, commercial use of these alloys may eventually exceed military uses.

Three important developments in magnesium research during 1947 were described by W. S. Loose of the Dow Chemical Co. magnesium laboratories at Midland, Mich. These are the electroplating of magnesium, the use of high frequency superimposed ac arc welding on magnesium, and the brazing of magnesium.

An electroplating technique was described by which it was possible to plate on a production basis some 1500 die cast parts per day over a period of 4 weeks at an efficiency of 96 to 98 pct, counting all rejects past rough inspection after die casting. The plating procedure for magnesium requires an entirely different method of preparation for the final deposit. The initial stages are specifically to remove contamination and to provide the correct type of reactive surface to promote adhesion and a continuous deposit. Then an adherent thin film of zinc is deposited on the magnesium part by a 3 min immersion in a specially prepared 4 pct zinc sulfate bath, after which plating is done in commercially used baths.

•

Tin

• • • **An estimate of** world tin production in 1948 to reach 150,000 to 160,000 tons was made last week by Erwin Vogelsang, chief of the Tin and Antimony Branch, Office of Materials Distribution at the Hygiene and Market Conference of the Lead Industries Assn. The estimate was based on political stability of the Far East producing areas and Bolivia. Mr. Vogelsang estimated that the United States would receive out of this production 32,000 long tons of tin metal in concentrates and 35,000 tons of fine tin. Together with an estimated secondary tin recovery of 24,000 tons, this would total 91,000 tons of tin available to the U.S. Unless some is placed into the strategic stockpile, this tonnage should permit allocation of 3500 tons more tin to U.S. consumers in 1948, according to Mr. Vogelsang.

•

Raise Brass Ingot Prices

New York

• • • **The low priced seller** of brass ingot increased prices early last week largely as the result of better demand for ingots and higher prices now obtaining for scrap. This increase of ½¢ per lb served to narrow the spread in ingot prices, as other producers have so far refrained from announcing price increases. The spread now ranges from ¼¢ on some grades to 1¢ on others.

Ingot producers and refiners have raised their copper and brass scrap buying prices by ¼¢ per lb in order to obtain scrap. Dealers have not been pushing sales of scrap for April delivery since yards are not overloaded as a result of the decline in receipts during the cold weather. There is also the impression among dealers that scrap is undervalued relative to the strength of the virgin copper market. Because of the buying price differential between ingot makers and refiners, the former are unable to obtain any copper grades.

The smelting charge on battery lead was reduced last week by $5 a ton to $35. This served to increase scrap buying prices by ½¢ per lb.

Nonferrous Metals Prices

Cents per pound

	Mar. 17	Mar. 18	Mar. 19	Mar. 20	Mar. 22	Mar. 23
Copper, electro, Conn.	21.50	21.50	21.50	21.50	21.50	21.50
Copper, Lake, Conn.	21.625	21.625	21.625	21.625	21.625	21.625
Tin, Straits, New York	94.00	94.00	94.00	94.00	94.00	94.00
Zinc, East St. Louis	12.00	12.00	12.00	12.00	12.00	12.00
Lead, St. Louis	14.80	14.80	14.80	14.80	14.80	14.80

Primary Metals

(Cents per lb. unless otherwise noted)

Aluminum, 99+%, f.o.b. shipping point, freight allowed	15.00
Aluminum pig, f.o.b. shipping point	14.00
Antimony, American, Laredo, Tex.	33.00
Beryllium copper, 3.75-4.25% Be dollars per lb contained Be	$20.50
Beryllium aluminum 5% Be, dollars per lb contained Be	$40.00
Cadmium, del'd	$1.75
Cobalt, 97-99% (per lb)	$1.65 to $1.72
Copper electro, Conn. Valley	21.50
Copper, lake, Conn. Valley	21.625
Gold, U. S. Treas., dollars per oz.	$35.00
Indium, 99.8%, dollars per troy oz.	$2.25
Iridium, dollars per troy oz.	$95 to $105
Lead, St. Louis	14.80
Lead, New York	15.00
Magnesium, 99.8+%, f.o.b. Freeport, Tex.	20.50
Magnesium, sticks, carlots	34.50
Mercury, dollars per 76-lb flask, f.o.b. New York	$77 to $79
Nickel, electro, f.o.b. New York	36.56
Palladium, dollars per troy oz.	$24.00
Platinum, dollars per troy oz.	$72 to $75
Silver, New York, cents per oz.	74.625
Tin, Grade A, New York	94.00
Zinc, East St. Louis	12.00
Zinc, New York	12.61
Zirconium copper, 6 pct Zr, per lb contained Zr.	$8.75

Remelted Metals

Brass Ingot

(Cents per lb, in carloads)

85-5-5-5 ingot	
No. 115	19.00–19.25
No. 120	18.50–18.75
No. 123	18.00–18.25
80-10-10 ingot	
No. 305	24.25
No. 315	21.75
88-10-2 ingot	
No. 210	30.00
No. 215	28.00
No. 245	21.75–22.75
Yellow ingot	
No. 405	15.00–16.00
Manganese bronze	
No. 421	18.00

Aluminum Ingot

(Cents per lb, lots of 30,000 lb)

95-5 aluminum-silicon alloys:	
0.30 copper, max.	17.50-17.75
0.60 copper, max.	17.25-17.50
Piston alloys (No. 122 type)	16.50-16.75
No. 12 alum. (No. 2 grade)	16.25-16.75
108 alloy	16.25-16.75
195 alloy	16.50-16.75
AXS-679	16.50-17.00
Steel deoxidizing aluminum, notch-bar, granulated or shot	
Grade 1—95 pct-95½ pct	16.50-17.00
Grade 2—92 pct-95 pct	16.00-16.50
Grade 3—90 pct-92 pct	15.75-16.00
Grade 4—85 pct-90 pct	15.25-15.50

Electroplating Supplies

Anodes

(Cents per lb, f.o.b. shipping point in 500 lb lots)

Copper, frt. allowed	
Cast, oval, 15 in. or longer	37⅝
Electrodeposited	32⅝
Rolled, oval, straight, delivered	33.09
Brass, 80-20, frt. allowed	
Cast, oval, 15 in. or longer	33⅜
Zinc, cast, 99.99	20.50
Nickel 99 pct plus, frt. allowed	
Cast	51
Rolled, depolarized	52
Silver 999 fine	
Rolled, 1000 oz lots per troy oz.	67¼

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum	43.00
Copper sulfate, 99.5, crystals, bbls.	11.50
Nickel salts, single, 425 lb bbls. frt. allowed	14.50
Silver cyanide, 100 oz. lots, per oz.	54.00
Sodium cyanide, 96 pct domestic, 100 lb drums	15.00
Zinc cyanide, 100 lb drums	34.00
Zinc sulfate, 89 pct, granules, bbls, frt. allowed	7.75

Mill Products

Aluminum

(Base prices, cents per pound, base 30,000 lb., f.o.b. shipping point, freight allowed.)

Flat Sheet: 0.188 in., 2S, 3S, 24¢; 4S, 61S-O, 25.8¢; 52S, 27.7¢; 24S-O, 24S-OAL, 26.7¢; 75S-O, 75S-OAL, 32.7¢. **0.081 in.;** 2S, 3S, 25¢; 4S, 61S-O, 27.1¢; 52S, 29¢; 24S-O, 24S-OAL, 27.7¢; 75S-O, 75S-OAL, 34.3¢. **0.032 in.;** 2S, 3S, 26.4¢; 4S, 61S-O, 30.1¢; 52S, 32.6¢; 24S-O, 24S-OAL, 34.2¢; 75S-O, 75S-OAL, 43.1¢.

Plate: ¼ in. and heavier; 2S, 3S, 21.2¢; 4S-F, 23.2¢; 52S, 24.2¢; 61S-O, 23.8¢; 24S-F,24S-FAL, 24.2¢; 75S, 75S-AL, 30.5¢.

Extruded Solid Shapes: Shape factors **1 to 4;** 31¢ to 59¢; **11 to 13,** 31.9¢ to 69¢; **23 to 25,** 33.4¢ to 90¢; **35 to 37,** 40.8¢ to $1.25; **47 to 49,** 58.7¢ to $1.84.

Extruded Round Rod, Square, Hex, Octagonal Bar: ¼ in. and over, 27¢ to 38¢; ½ to ¾ in., 28¢ to 40.5¢; ⅜ to ½ in., 29¢ to 43¢; ¼ to ⅜ in., 30¢ to 46.5¢; ⅞ to ⅞ in., 32.5¢ to 53.5¢; 9/64 to ⅝ in., 35.5¢ to 62¢.

Rolled Rod: 1.064 to 4.5 in., 2S, 3S, 30¢ to 26.5¢; Cold-finished rod, 0.375 to 3.5 in., 2S, 3S, 32¢ to 28¢.

Screw Machine Stock: Drawn, 1½ to ⅛ in., 11S-T3, 34¢ to 45¢; cold-finished, ⅝ to 1½ in., 11S-T3, 33¢ to 31¢; rolled, 1⅛ to 3 in., 11S-T3, 31¢ to 28.5¢.

Drawn Wire: coiled, 0.051 to 0.374 in.; 2S, 33¢ to 24¢ 52S, 40.5c to 29c; 56S, 42.5¢ to 34.5¢; 17S-T4, 46¢ to 31¢; 61S-T4, 41c to 30.5c; 75S-T6, 66¢ to 46¢.

Magnesium

(Cents per lb, f.o.b. mill, freight allowed. Base quantity 30,000 lb.)

Sheet and Plate: Ma. FSa. ¼ in., 54¢-56¢; 0.188 in., 56¢-58¢; B & S gage 8, 58c-60c; 10, 59c-61c; 12, 63-65c; 14, 69c-74c; 16, 76c-81c; 18, 84c-89c 20, 96c-$1.01; 22, $1.22-$1.31; 24, $1.62-$1.75. Specification grade higher.

Round Rod: M, diam., in., ¼ to ⅜, 47¢; ½ to ¾, 45¢; 1¼ to 2½, 43.5¢; 3½ to 5, 42.5¢. Other alloys higher.

Square, Hexagonal Bar: M, size across flats, in., ¼ to ⅜, 52.5¢; ½ to ¾, 47.5¢; 1¼ to 2½, 45¢; 3½ to 5, 44¢. Other alloys higher.

Solid Shapes, Rectangles: M, form factors, 1 to 4, 46¢; 11 to 13, 49¢; 20 to 22, 51.5¢; 29 to 31, 59.5¢; 38 to 40, 75.5¢; 47 to 49, 98¢. Other alloys higher.

Round Tubing: M, wall thickness, outside diam, in., 0.049 to 0.057, ¼ to ⅞, $1.21; ⅞ to ⅜, $1.12; ⅜ to ⅞, 97¢; 0.058 to 0.064, ⅞ to ½, 89¢; ½ to ⅝, 81¢; 0.065 to 0.082, ⅝ to ¾, 76¢; ¾ to 1, 72¢; 0.083 to 0.108, 1 to 2, 68¢; 0.165 to 0.219, 2 to 3, 59¢; 3 to 4, 57¢. Other alloys higher.

Nickel and Monel

(Cents per lb, f.o.b. mill)

	Nickel	Monel
Sheets, cold-rolled	54	43
No. 35 sheets		41
Strip, cold-rolled	60	44
Rod		
Hot-rolled	50	39
Cold-drawn	55	44
Angles, hot-rolled	50	39
Plates	52	41
Seamless tubes	83	71
Shot and blocks		31

Copper, Brass, Bronze

(Cents per pound, freight prepaid on 200 lb)

	Extruded Shapes	Rods	Sheets
Copper	33.53	....	33.68
Copper, hot-rolled	....	30.03	....
Copper, drawn	....	31.03	....
Low brass	34.36*	31.39	31.70
Yellow brass	32.92*	29.85	30.16
Red brass	34.89*	31.92	32.23
Naval brass	30.28	29.03	34.97
Leaded brass	28.64	24.69	....
Commercial bronze	35.68*	32.96	33.27
Manganese bronze	33.87	32.37	38.47
Phosphor bronze, 5 pct	53.95*	52.95	52.70
Muntz metal	29.80	28.55	32.99
Everdur, Herculoy, Olympic, etc.	37.24	37.50	38.56
Nickel silver, 10 pct.	41.80	42.68	40.54
5 pct	....	....	38.98
Architectural bronze	28.61	....	....

*Seamless tubing.

Scrap Metals

Brass Mill Scrap

(Cents per pound; add 1¢ per lb for shipments of 15,000 lb or more.)

	Heavy	Turnings
Copper	19⅛	18⅜
Yellow brass	15⅝	14⅜
Red brass	17½	16¾
Commercial bronze	17⅝	16⅞
Manganese bronze	15¼	14⅜
Leaded brass rod ends	15¾	....

Custom Smelters' Scrap

(Cents per pound, carload lots, delivered to refinery.)

No. 1 copper, wire	18.25
No. 2 copper, wire	17.25
Light copper	16.25
Refining brass	15.75*

*Dry copper content

Ingot Makers' Scrap

(Cents per pound, carload lots, delivered to producer.)

No. 1 copper, wire	17.50
No. 2 copper wire	16.50
Light copper	15.50
No. 1 composition	14.25
No. 1 comp. turnings	14.00
Low brass	11.50
Brass pipe	11.00–11.25
Radiators	11.00–11.25
Heavy yellow brass	10.00
Aluminum	
Mixed old cast	9.75
Mixed old clips	9.75
Mixed turnings	9.00
Pots & pans	10.00
Low copper	10.50

Dealers' Scrap

(Dealers' buying prices, f.o.b. New York in cents per pound.)

Copper and Brass	
No. 1 heavy copper and wire	16¼—16¾
No. 2 heavy copper and wire	15¼—15¾
Light copper	14¼—14¾
Auto radiators (unsweated)	9¼— 9¾
No. 1 composition	11¾—12¼
No. 1 composition turnings	11¼—11¾
Clean red car boxes	9½—10
Cocks and faucets	9½—10
Mixed heavy yellow brass	7¼— 7¾
Old rolled brass	7¾— 8¼
Brass pipe	9 — 9¼
New soft brass clippings	11¼—11¾
Brass rod ends	9¾—10¼
No. 1 brass rod turnings	9¼— 9¾
Aluminum	
Alum. pistons with struts	4½— 5
Aluminum crankcases	6½— 7
2S aluminum clippings	9 — 9½
Old sheet & utensils	7 — 7½
Dry borings and turnings	2½— 3
Misc. cast aluminum	6½— 7
Dural clips (24S)	6 — 6½
Zinc	
New zinc clippings	7 — 7½
Old zinc	5 — 5½
Zinc routings	3 — 3½
Old die cast scrap	3 — 3½
Nickel and Monel	
Pure nickel clippings	16 —17
Clean nickel turnings	12½—13
Nickel anodes	16 —17
Nickel rod ends	16 —17
New Monel clippings	12 —13
Clean Monel turnings	7 — 8
Old sheet Monel	10 —10½
Old Monel castings	7½— 8
Inconel clippings	8 — 8½
Nickel silver clippings, mixed	8 — 8½
Nickel silver turnings, mixed	6½— 7
Lead	
Soft scrap lead	12¾—13¼
Battery plates (dry)	7¼— 7¾
Magnesium Alloys	
Segregated solids	7½— 8
Castings	4½— 5½
Miscellaneous	
Block tin	75 —77
No. 1 pewter	60 —62
No. 1 auto babbitt	45 —47
Mixed common babbitt	13¾—14¼
Solder joints	16¾—17¼
Siphon tops	45 —47
Small foundry type	16¼—16¾
Monotype	15¼—15¾
Lino. and stereotype	14¼—14¾
Electrotype	11¾—12¼
New type shell cuttings	14½—15
Hand picked type shells	6½— 7
Lino and stereo dross	6½— 7
Electro dross	5½— 6

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SCRAP

. . . News and Market Activities

Coal Shortage Threatens Present Stability

New York

• • • **Shipments and** receipts continued at high levels and the exceptional market balance in steel making grades seen last week was still evident.

Prices remain firmly at formula although the first mill to speak out in regard to the impending coal shortage looks for a $2 slash in material to be purchased April 1st. It is still too early to gage the effect of the miners' work stoppage, but some mills are already in a position to lose tonnage even if there is an immediate settlement and when openhearths start cooling the market must soften.

At the moment the coal shortage threat is contributing to activity, as aside from price considerations an enforced decrease in mill operations will mean an eventual back up of metal in the yards and against that possibility, many dealers are hustling scrap through in an effort to keep their space comparatively clean.

Tendencies toward premium price resistance in the cast grades first appeared to be a definite reluctance, especially on the part of the large consumers, to pay the top figures.

The seriousness of the coal situation does not seem to have penetrated scrap market thinking as yet. And it has not had any considerable effect yet. But if things are no nearer settlement in another two weeks, and at the present rate of progress there is little reason for thinking they may be, the situation will have all concerned really biting their nails.

•

PITTSBURGH—Brokers reported a little stronger tone this week but with few price changes to show for it. The railroad specialties were up 50¢ and short rails were much stronger. Scrap rails were $1 higher and so was No. 1 cast. The trade expected fairly high steelmaking operations on the district for the week. Normally this produces a stronger tone in the early stages of a coal strike, as mills increase the ratio of scrap in the openhearth charge. It was not at all certain this week that steel companies would again attempt to maintain operations by this technique because scrap charges are already relatively high. Observers look for price weakness as soon as a number of openhearths begin going down.

•

CHICAGO—Prices of scrap in Chicago marked time this week pending developments in the coal strike and the closing of railroad scrap lists. Mills continued to buy industrial offerings in normal volume and the return of milder weather was expected to make more country scrap available. Although local foundries are out of the market the tone of the cast market is firm to strong. Most sources here expected a continued sidewise movement of prices until decisions in the critical coal situation are reached.

•

PHILADELPHIA—The scrap market is strong in this district and mills placed orders for No. 2 grades last week at $39.00. Some mills are calling for quick delivery of steel grades. There is no present evidence of weakness having developed due to the coal mine shut-down which has not yet affected operations here. Broker buying of No. 1 grades sets these grades at a price of $41.00 to $42.00. Turnings are selling in the range of $33.50 to $34.50. Cast grades are strong and some sales have been reported at prices well solve current quotations. Railroad scrap sales are reported to be above formula. In a recent sale by the Navy Yard, No. 1 melting is reported to have been sold at $41.57, mixed scrap at $37.13, both f.o.b. Philadelphia.

•

CLEVELAND—Despite seasonal increases in shipments to consumers here and in the Valley, the scrap market is very strong. Material is moving freely at formula prices, but not in the tonnages desired by the mills and other consumers. Mills are very definitely on the formula, but there are rumblings in the trade that some of the big customers are not. Unless openhearths are taken off because of the coal strike, there is no promise of weakness in the present market, particularly in view of the military preparedness program now under discussion.

•

DETROIT—Scrap prices here remain unchanged this week at formula levels although the possibility that the market may dip as a result of developments in the coal industry are seen by some informed sources. Scrap movements have been satisfactory although the model change of a large producer has naturally cut into available supplies. Cast iron prices continue to hang on at very high levels supported no doubt by the current shortage of pig iron.

•

BIRMINGHAM—Demand remains strong here for openhearth and blast furnace material and the market was active at formula levels. Foundry operators were holding back on cast purchases as their coke supplies began to dwindle. Movement of agricultural scrap slowed as farmers went into the fields for spring planting.

•

BUFFALO—Pressure for foundry specialties eased noticeably in the past week and sellers said business was difficult to develop at prevailing premiums. Buying on old orders held No. 1 heavy melting steel at $43 to $45, but low phosphorous plate slipped another notch to $44.75 to $46.00. Fair sales of the latter were made at the inside price. The undertone of cast scrap also was softer. Large consumers have good sized reserves of cast purchased at substantially lower levels, but the truck load buyers continued to pay fancy prices though less frequently. In the openhearth grades movement through yards was being expedited because of the coal strike and the likelihood of shipments being held up in case of a prolonged stoppage.

•

NEW YORK—The exceptionally steady condition and good activity of this market continues. Cast grades have levelled off and are showing traces of softness in the premium priced items. Local foundries have been able to get additional material trucked to them as a result of spring weather, although actually the weather's sporadic behavior has still not allowed the spring cleanup to get into high gear and dealers are still hoping for four straight good days.

•

BOSTON—With consumers stocked and offerings a little more plentiful, the market for cast is easier and approximately $5 off from the recent peak. Otherwise prices are on the formula basis with shipments of turnings, borings and busheling fairly heavy, and of heavy steel moderately so.

•

CINCINNATI—Openhearth grades are moving freely at formula prices, but cast grades are a little weaker again. The weakness in cast, however, is preponderantly in the mixed grades, not in the No. 1 material. Trade sources report the softness can be attributed to the coal strike and the fact that foundries seem to be pretty well fortified against the next few weeks.

•

ST. LOUIS—Shipments are moving fairly well, but caution moves both buyer and seller because of the coal strike. If the coal strike is prolonged it may be that prices will be easier temporarily.

Going prices as obtained in the trade by THE IRON AGE, based on representative tonnages.

PITTSBURGH

Per gross ton delivered to consumer:

No. 1 hvy. melting	$40.00 to $40.50
RR. hvy. melting	41.00 to 41.50
No. 2 hvy. melting	40.00 to 40.50
RR. scrap rails	55.00 to 56.00
Rails 2 ft and under	62.00 to 63.00
No. 1 comp'd bundles	40.00 to 40.50
Hand bdld. new shts	40.00 to 40.50
Hvy. axle turn.	41.50 to 42.00
Hvy. steel forge turn	41.50 to 42.00
Mach. shop turn	35.00 to 35.50
Shoveling turn.	37.50 to 38.00
Mixed bor. and turn	35.00 to 35.50
Cast iron boring	37.50 to 38.00
No. 1 cupola cast.	61.00 to 63.00
Hvy. breakable cast	51.00 to 52.00
Malleable	77.00 to 79.00
RR. knuck. and coup	54.00 to 55.00
RR. coil springs	54.00 to 55.00
RR. leaf springs	54.00 to 55.00
Rolled steel wheels	54.00 to 55.00
Low phos.	47.00 to 47.50

CHICAGO

Per gross ton delivered to consumer:

No. 1 hvy. melting	$38.50 to $39.50
No. 2 hvy. melting	37.00 to 37.50
No. 1 bndules	38.50 to 39.50
No. 2 dealers' bundles	37.00 to 37.50
Bundled mach. shop turn.	37.00 to 37.50
Galv. bundles	35.00 to 35.50
Mach. shop turn.	33.50 to 34.50
Short shov. turn.	35.00 to 36.50
Cast iron borings	34.50 to 35.50
Mix. borings & turn.	33.50 to 34.50
Low phos. hvy. forge	44.00 to 48.00
Low phos. plates	42.50 to 46.00
No. 1 RR. hvy. melt	41.25 to 41.75
Rerolling rails	49.50 to 50.00
Miscellaneous rails	48.00 to 50.00
Angles & splice bars	49.00 to 52.00
Locomotive tires, cut	50.00 to 52.00
Cut bolster & side frames	47.00 to 48.00
Standard stl. car axles	54.00 to 57.00
No. 3 steel wheels	46.00 to 50.00
Couplers & knuckles	47.00 to 49.00
Rails, 2 ft and under	54.00 to 56.00
Malleable	70.00 to 72.00
No. 1 mach. cast.	68.00 to 70.00
No. 1 agricul. cast.	63.00 to 64.00
Heavy breakable cast.	50.00 to 52.00
RR. grate bars	56.00 to 58.00
Cast iron brake shoes	55.00 to 57.00
Cast iron carwheels	57.00 to 58.00

CINCINNATI

Per gross ton delivered to consumer:

No. 1 hvy. melting	$38.50 to $39.50
No. 2 hvy. melting	38.50 to 39.50
No. 1 bundles	38.50 to 39.50
No. 2 bundles	38.50 to 39.50
Mach. shop turn.	33.00 to 33.50
Shoveling turn.	35.00 to 35.50
Cast iron borings	32.50 to 33.00
Mixed bor. & turn	32.50 to 33.00
Low phos., plate	46.00 to 48.00
No. 1 cupola cast	63.00 to 64.00
Hvy. breakable cast	53.00 to 54.00
Rails 18 in. & under	59.00 to 60.00
Rails random length	51.00 to 52.00
Drop broken	66.00 to 68.00

BOSTON

Dealers' buying prices per gross ton, f.o.b. cars:

No. 1 hvy. melting	$31.65 to $31.90
No. 2 hvy. melting	31.65 to 31.90
Nos. 1 and 2 bundles	31.65 to 31.90
Busheling	31.65 to 31.90
Shoveling turn.	.... 28.90
Machine shop trun.	.... 26.90
Mixed bor. & turn	.... 26.90
Cl'n cast. chem. bor.	.... 36.00
No. 1 machinery cast	60.00 to 61.00
No. 2 machinery cast	60.00 to 61.00
Heavy breakable cast	53.00 to 55.00
Stove plate	50.00 to 55.00

DETROIT

Per gross ton, brokers' buying prices f.o.b. cars:

No. 1 hvy. melting	.... $35.50
No. 2 hvy. melting	.... 35.50
No. 1 bundles	.... 35.50
New busheling	.... 35.50
Flashings	.... 35.50
Mach. shop turn.	$29.00 to 29.50
Shoveling turn.	30.00 to 30.50
Cast iron borings	30.00 to 30.50
Mixed bor. & turn.	28.50 to 29.00
Low phos. plate	39.50 to 40.50
No. 1 cupola cast.	60.00 to 62.00
Heavy breakable cast.	52.00 to 55.00
Stove plate	52.00 to 55.00
Automotive cast.	60.00 to 62.00

PHILADELPHIA

Per gross ton delivered to consumer:

No. 1 hvy. melting	$41.00 to $42.00
No. 2 hvy. melting	38.00 to 39.00
No. 1 bundles	41.00 to 42.00
No. 2 bundles	38.00 to 39.00
Mach. shop turn.	33.50 to 34.50
Shoveling turn.	33.50 to 34.50
Mixed bor. & turn.	33.50 to 34.50
Clean cast chemical bor.	40.00 to 42.00
No. 1 machinery cast	65.00 to 66.00
No. 1 mixed yard cast	63.00 to 65.00
Hvy. breakable cast.	59.00 to 60.00
Clean auto cast.	63.00 to 65.00
Hvy. axle forge turn	40.00 to 41.00
Low phos. plate	44.50 to 45.50
Low phos. punchings	44.50 to 45.50
Low phos. bundles	43.00 to 44.00
RR. steel wheels	51.00 to 52.00
RR. coil springs	51.00 to 52.00
RR. malleable	72.00 to 75.00

ST. LOUIS

Per gross ton delivered to consumer:

No. 1 hvy. melting	$41.00 to $42.00
No. 2 hvy. melting	37.50 to 38.50
Bundled sheets	37.50 to 38.50
Mach. shop turn.	33.00 to 33.50
Locomotive tires, uncut	46.00 to 48.00
Mis. std. sec. rails	48.00 to 50.00
Rerolling rails	50.00 to 51.00
Steel angle bars	57.00 to 58.00
Rails 3 ft and under	53.00 to 55.00
RR. steel springs	48.00 to 50.00
Steel car axles	48.00 to 50.00
Grate bars	56.00 to 57.00
Brake shoes	54.00 to 55.00
Malleable	71.00 to 72.00
Cast iron car wheels	54.00 to 55.00
No. 1 machinery cast	64.00 to 65.00
Hvy. breakable cast	56.00 to 57.00

BIRMINGHAM

Per gross ton delivered to consumer:

No. 1 hvy. melting	$37.50 to $38.50
No. 2 hvy. melting	37.50 to 38.50
No. 2 bundles	37.50 to 38.50
No. 1 busheling	37.50 to 38.50
Long turnings	25.00 to 26.00
Shoveling turnings	27.00 to 28.00
Cast iron borings	26.00 to 27.00
Bar crops and plate	42.50 to 43.50
Structural and plate	42.50 to 43.50
No. 1 cupola cast.	60.00 to 65.00
Stove plate	55.00 to 58.00
No. 1 RR. hvy. melt.	37.50 to 38.50
Steel axles	38.00 to 39.00
Scrap rails	44.00 to 45.00
Rerolling rails	52.00 to 54.00
Angles & splice bars	47.50 to 50.00
Rails 3 ft & under	52.00 to 56.00
Cast iron carwheels	48.00 to 50.00

YOUNGSTOWN

Per gross ton delivered to consumer:

No. 1 hvy. melting	$40.00 to $40.50
No. 2 hvy. melting	40.00 to 40.50
Mach. shop turn.	35.00 to 35.50
Short shov. turn.	37.00 to 37.50
Cast iron borings	36.00 to 36.50
Low phos.	45.00 to 45.50

NEW YORK

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	.... $34.50
No. 2 hvy. melting	.... 34.50
No. 2 bundles	.... 34.50
Comp. galv. bundles	$30.50 to 31.50
Mach. shop turn.	29.00 to 30.00
Mixed bor. & turn.	29.00 to 30.00
Shoveling turn.	31.00 to 32.00
No. 1 cupola cast.	60.00 to 61.00
Clean auto cast.	60.00 to 61.00
Hvy. breakable cast.	55.00 to 56.00
Charging box cast.	55.00 to 56.00
Stove plate	51.00 to 52.00
Unstrp. motor blks.	50.00 to 51.00
Cl'n chem. cast bor.	34.50 to 35.50

BUFFALO

Per gross ton delivered to consumer:

No. 1 hvy. melting	$43.00 to $45.00
No. 2 hvy. melting	.... 39.75
No. 1 bundles	.... 39.75
No. 2 bundles	.... 39.75
No. 1 busheling	.... 39.75
Mach. shop turn.	34.75 to 35.25
Shoveling turn.	36.75 to 37.25
Cast iron borings	.... 35.75
Mixed bor. & turn	.... 34.75
Mixed cupola cast.	60.00 to 62.00
Charging box cast.	54.00 to 55.00
Stove plate	58.00 to 60.00
Clean auto cast.	62.00 to 65.00
RR. malleable	70.00 to 75.00
Small indl. malleable	47.00 to 49.00
Low phos. plate	44.75 to 46.00
Scrap rails	58.00 to 59.00
Rails 3 ft & under	60.00 to 61.00
RR. steel wheels	51.00 to 52.00
Cast iron carwheels	51.00 to 52.00
RR. coil & leaf spgs	51.00 to 52.00
RR. knuckles & coup	51.00 to 52.00

CLEVELAND

Per gross ton delivered to consumer:

No. 1 hvy. melting	$39.50 to $40.00
No. 2 hvy. melting	39.50 to 40.00
No. 1 bundles	39.50 to 40.00
No. 1 busheling	39.50 to 40.00
Drop forge flashings	39.50 to 40.00
Mach. shop turn.	34.50 to 35.00
Shoveling turn.	35.50 to 36.00
Steel axle turn.	39.50 to 40.00
Cast iron borings	35.50 to 36.00
Mixed bor. & turn.	35.50 to 36.00
Low phos.	44.50 to 45.00
No. 1 machinery cast.	65.00 to 70.00
Malleable	75.00 to 80.00
RR. cast.	70.00 to 73.00
Railroad grate bars	60.00 to 62.00
Stove plate	60.00 to 62.00
RR. hvy. melting	40.00 to 40.50
Rails 3 ft & under	60.00 to 61.00
Rails 18 in. & under	61.00 to 62.00

SAN FRANCISCO

Per gross ton f.o.b. shipping point:

No. 1 hvy. melting	.... $25.00
No. 2 hvy. melting	.... 25.00
No. 2 bales	.... 25.00

Per gross ton delivered to consumer:

No. 3 bales	.... $19.50
Mach. shop turn.	.... 16.00
Elec. furn. 1 ft under	$32.00 to 34.00
No. 1 cupola cast.	34.00 to 37.00
RR. hvy. melting	.... 26.00

LOS ANGELES

Per gross ton delivered to consumer:

No. 1 hvy. melting	.... $25.50
No. 2 hvy. melting	.... 25.50
No. 1 bales	.... 25.50
No. 2 bales	.... 25.50
No. 3 bales	.... 19.50
Mach. shop turn.	.... 17.50
No. 1 cupola cast.	$40.00 to 43.00
RR. hvy. melting	.... 26.50

SEATTLE

Per gross ton delivered to consumer:

No. 1 & No. 2 hvy. melt	.... $26.00
Elec. furn. 1 ft and under	.... 30.00
No. 1 cupola cast.	40.00 to 42.00
RR. hvy. melting	.... 30.00

HAMILTON, ONT.

Per gross ton delivered to consumer: Cast grades f.o.b. shipping point.

Heavy melting	$22.00*
No. 1 bundles	22.00*
No. 2 bundles	21.50*
Mechanical bundles	20.00*
Mixed steel scrap	19.00*
Mixed borings and turnings	17.00*
Rails, remelting	23.00*
Rails, rerolling	26.00*
Bushelings	17.00*
Bushelings, new fact, prep'd	21.00*
Bushelings, new fact, unprep'd	16.00*
Short steel turnings	17.00*
No. 1 cast	$42.00 to 43.00
No. 2 cast	35.00 to 37.00

*Ceiling Price.

Comparison of Prices . .

Advances over past week in **Heavy Type**, declines in *Italics*. Prices are f.o.b. major basing points. The various basing points for finished and semifinished steel are listed in the detailed price tables.

Flat-Rolled Steel: (cents per pound)	Mar. 23, 1948	Mar. 16, 1948	Feb. 24, 1948	Mar. 25, 1947
Hot-rolled sheets	2.80	2.80	2.80	2.50
Cold-rolled sheets	3.55	3.55	3.55	3.20
Galvanized sheets (10 ga.)	3.95	3.95	3.95	3.55
Hot-rolled strip	2.80	2.80	2.80	2.50
Cold-rolled strip	3.55	3.55	3.55	3.20
Plates	2.95	2.95	2.95	2.65
Plates wrought iron	7.25	7.25	7.25	5.95
Stain's c-r strip (No. 302)	30.50	30.50	30.50	30.50
Tin and Terneplate: (dollars per base box)				
Tinplate (1.50 lb) cokes.	$6.80	$6.80	$6.80	$5.75
Tinplate, electro (0.50 lb)	6.00	6.00	6.00	5.05
Special coated mfg. ternes	5.90	5.90	5.90	4.90
Bars and Shapes: (cents per pound)				
Merchant bars	2.90	2.90	2.90	2.60
Cold-finished bars	3.55	3.55	3.55	3.20
Alloy bars	3.30	3.30	3.30	3.05
Structural shapes	2.80	2.80	2.80	2.50
Stainless bars (No. 302)	26.00	26.00	26.00	26.00
Wrought iron bars	8.65	8.65	8.65	6.15
Wire: (cents per pound)				
Bright wire	3.55	3.55	3.55	3.30
Rails: (dollars per 100 lb)				
Heavy rails	$2.75	$2.75	$2.75	$2.50
Light rails	3.10	3.10	3.10	2.85
Semifinished Steel: (dollars per gross ton)				
Rerolling billets	$45.00†	$45.00†	$45.00†	$42.00
Slabs, rerolling	45.00†	45.00†	45.00†	42.00
Forging billets	54.00†	54.00†	54.00†	**50.00**
Alloy blooms, billets, slabs	66.00	66.00	66.00	61.00
Wire Rods and Skelp: (cents per pound)				
Wire rods	2.80	2.80	2.80	2.55
Skelp	2.90	2.90	2.60	2.35

†Net ton

Pig Iron: (per gross ton)	Mar. 23, 1948	Mar. 16, 1948	Feb. 24, 1948	Mar. 25, 1947
No. 2, foundry, Phila.	$44.61	$44.61	$44.61	$36.51
No. 2, Valley furnace	39.50	39.50	39.50	33.50
No. 2, Southern Cin'ti	43.28	43.28	43.28	34.75
No. 2, Birmingham	37.38	37.38	37.38	29.88
No. 2, foundry, Chicago†	39.00	39.00	39.00	33.00
Basic del'd Philadelphia	44.11	44.11	44.11	36.92
Basic, Valley furnace	39.00	39.00	39.00	33.00
Malleable, Chicago†	39.50	39.50	39.50	33.50
Malleable, Valley	39.50	39.50	39.50	33.50
Charcoal, Chicago	62.46	62.46	62.46	45.99
Ferromanganese‡	145.00	145.00	145.00	135.00

† The switching charge for delivery to foundries in the Chicago district is $1 per ton.
‡ For carlots at seaboard.

Scrap: (per gross ton)				
Heavy melt'g steel, P'gh.	$40.25	$40.25	$40.25	$41.00
Heavy melt'g steel, Phila.	**41.50**	40.00	41.00	40.25
Heavy Melt'g steel, Ch'go	39.00	39.00	38.75	37.25
No. 1, hy. comp. sheet, Det.	35.50	35.50	35.50	35.00
Low phos. Young'n	45.25	45.25	45.25	44.25
No. 1, cast, Pittsburgh	**62.00**	61.00	59.50	44.50
No. 1, cast, Philadelphia	65.50	65.50	65.50	50.00
No. 1, cast, Chicago	69.00	69.00	64.50	46.50
Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	$12.50	$12.50	$12.50	$9.00
Foundry coke, prompt	14.00	14.00	14.00	10.25
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electro, Conn.	21.50	21.50	21.50	21.50
Copper, Lake Conn.	21.625	21.625	21.625	21.625
Tin, Grade A, New York	94.00	94.00	94.00	70.00
Zinc, East St. Louis	12.00	12.00	12.00	10.50
Lead, St. Louis	14.80	14.80	14.80	14.80
Aluminum, virgin	15.00	15.00	15.00	15.00
Nickel, electrolytic	36.56	36.56	36.56	37.67
Magnesium, ingot	20.50	20.50	20.50	20.50
Antimony, Laredo, Tex.	33.00	33.00	33.00	33.00

Composite Prices . .

Starting with the issue of Apr. 22, 1943, the weighted finished steel index was revised for the years 1941, 1942, and 1943. See explanation of the change on p. 90 of the Apr. 22, 1943, issue. Index revised to a quarterly basis as of Nov. 16, 1944; for details see p. 98 of that issue. The finished steel composite price for the current quarter is an estimate based on finished steel shipments for the previous quarter. This figure will be revised when shipments for this quarter are compiled.

	FINISHED STEEL (Base Price)	PIG IRON	SCRAP STEEL
Mar. 23, 1948	3.23940¢ per lb.	$40.29 per gross ton	$40.25 per gross ton
One week ago	3.23940¢ per lb.	$40.29 per gross ton	$39.75 per gross ton
One month ago	3.23940¢ per lb.	$40.37 per gross ton	$40.00 per gross ton
One year ago	2.86354¢ per lb.	$33.15 per gross ton	$39.50 per gross ton

	HIGH	LOW
1948	3.23940¢ Feb. 17	3.19411¢ Jan. 6
1947	3.19411¢ Oct. 7	2.87118¢ Jan. 7
1946	2.83599¢ Dec. 31	2.54490¢ Jan. 1
1945	2.44104¢ Oct. 2	2.38444¢ Jan. 2
1944	2.30837¢ Sept. 5	2.21189¢ Oct. 5
1943	2.29176¢	2.29176¢
1942	2.28249¢	2.28249¢
1941	2.43078¢	2.43078¢
1940	2.30467¢ Jan. 2	2.24107¢ Apr. 16
1939	2.35367¢ Jan. 3	2.26689¢ May 16
1938	2.58414¢ Jan. 4	2.27207¢ Oct. 18
1937	2.58414¢ Mar. 9	2.32263¢ Jan. 4
1936	2.32263¢ Dec. 28	2.05200¢ Mar. 10
1935	2.07642¢ Oct. 1	2.06492¢ Jan. 8
1934	2.15367¢ Apr. 24	1.95757¢ Jan. 2
1933	1.95578¢ Oct. 3	1.75836¢ May 2
1932	1.89196¢ July 5	1.83901¢ Mar. 1
1931	1.99626¢ Jan. 13	1.86586¢ Dec. 29
1930	2.25488¢ Jan. 7	1.97319¢ Dec. 9
1929	2.31773¢ May 28	2.26498¢ Oct. 29

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strip, representing major portion of finished steel shipments. Index recapitulated in Aug. 28, 1941, issue.

	HIGH	LOW
1948	$40.37 Feb. 17	$39.58 Jan. 6
1947	37.98 Dec. 30	30.14 Jan. 7
1946	30.14 Dec. 10	25.37 Jan. 1
1945	25.37 Oct. 23	23.61 Jan. 2
1944	$23.61	$23.61
1943	23.61	23.61
1942	23.61	23.61
1941	$23.61 Mar. 20	$23.45 Jan. 2
1940	23.45 Dec. 23	22.61 Jan. 2
1939	22.61 Sept. 19	20.61 Sept. 12
1938	23.25 June 21	19.61 July 6
1937	23.25 Mar. 9	20.25 Feb. 16
1936	19.74 Nov. 24	18.73 Aug. 11
1935	18.84 Nov. 5	17.83 May 14
1934	17.90 May 1	16.90 Jan. 27
1933	16.90 Dec. 5	13.56 Jan. 3
1932	14.81 Jan. 5	13.56 Dec. 6
1931	15.90 Jan. 6	14.79 Dec. 15
1930	18.21 Jan. 7	15.90 Dec. 16
1929	18.71 May 14	18.21 Dec. 17

Based on averages for basic iron at valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

	HIGH	LOW
1948	$41.83 Jan. 29	$39.75 Mar. 9
1947	42.58 Oct. 28	29.50 May 20
1946	31.17 Dec. 24	19.17 Jan. 1
1945	19.17 Jan. 2	18.92 May 22
1944	19.17 Jan. 11	15.76 Oct. 24
1943	$19.17	$19.17
1942	19.17	19.17
1941	$22.00 Jan. 7	$19.17 Apr. 10
1940	21.83 Dec. 30	16.04 Apr. 9
1939	22.50 Oct. 3	14.08 May 16
1938	15.00 Nov. 22	11.00 June 7
1937	21.92 Mar. 30	12.67 June 9
1936	17.75 Dec. 21	12.67 June 8
1935	13.42 Dec. 10	10.33 Apr. 29
1934	13.00 Mar. 13	9.50 Sept. 25
1933	12.25 Aug. 8	6.75 Jan. 3
1932	8.50 Jan. 12	6.43 July 5
1931	11.33 Jan. 6	8.50 Dec. 29
1930	15.00 Feb. 18	11.25 Dec. 9
1929	17.58 Jan. 29	14.08 Dec. 8

Based on No. 1 heavy melting steel scrap quotations to consumers at Pittsburgh, Philadelphia and Chicago.

Iron and Steel Prices . . .

Steel prices shown here are f.o.b. basing points in cents per pound or dollars per gross ton unless otherwise indicated. Extras apply. Delivered prices do not reflect 3 pct tax on freight. Industry practice has discontinued arbitrary f.o.b. prices at Gulf and Pacific Ports. Space limitations prevent quotation of delivered prices at major ports. (1) Commercial quality sheet grade; primes, 25¢ above base. (2) Commercial quality grade. (3) Widths up to 12-in. inclusive. (4) 0.25 carbon and less. (5) Cokes, 1.25 lb, deduct 20¢ per base box. (6) For merchant trade. (7) For straight length material only from producers to fabricators. (8) Also shafting. For quantities of 40,000 lb & over. (9) Carload lot in manufacturing trade. (10) Delivered Los Angeles only. (11) Hollowware enameling, gages 29 to 31 only. (12) Produced to dimensional tolerances in AISI Manual Sec. 6. (13) Delivered San Francisco only. (14) Kaiser Co. prices (15) to 0.035 to 0.075 in. thick by ¾ to 3½ in. wide. (16) Delivered Los Angeles; add ½¢ per 100 lb for San Francisco. (17) Slab prices subject to negotiation in most cases. Some producers charge (18) $2 more. (19) $1 per ton more.

Basing Points	Pitts-burgh	Chicago	Gary	Cleve-land	Birm-ingham	Buffalo	Youngs-town	Spar-rows Point	Granite City	Middle-town, Ohio		San Franc'co, Los Angeles, Seattle	DELIVERED TO Detroit	New York	Phila-delphia
INGOTS Carbon, rerolling	($36.00 per net ton f. o. b. mill) (Spot market as high as $75 to $90 gross ton)														
Carbon, forging	$46.00	(per net ton)													
Alloy	$56.00									(Canton = $56.00)					
BILLETS, BLOOMS, SLABS Carbon, rerolling[17]	$45.00[18]	$45.00[18]	$45.00[18]	$47.00	$45.00[18]	$45.00[18]	(per net ton)								
Carbon, forging billets	$54.00	$54.00	$54.00	$54.00	$54.00	$54.00	(per net ton)								
Alloy	$66.00	$66.00				$66.00	(Bethlehem, Massillon, Canton = $66.00)								
SHEET BARS								Subject to negotiation							
PIPE SKELP	2.90¢						2.90¢								
WIRE RODS	2.80¢[19]	2.80¢		2.80¢	2.85¢		(Worcester = 2.90¢)					3.52¢[13]			
SHEETS Hot-rolled	2.80¢	2.80¢	2.80¢	2.80¢	2.80¢	2.80¢	2.80¢	2.80¢		(Ashland, Ky. = 2.80¢)		3.54¢[16]	2.96¢	3.148¢	3.040¢
Cold-rolled[1]	3.55¢	3.55¢	3.55¢	3.55¢		3.55¢	3.55¢		3.65¢	3.55¢			3.71¢	4.00¢	4.016¢
Galvanized (10 gage)	3.95¢	3.95¢	3.95¢		3.95¢		3.95¢	3.95¢	4.05¢	3.95¢	(Ashland = 3.95¢)	4.62¢[16]		4.298¢	4.190¢
Enameling (12 gage)	3.95¢	3.95¢	3.95¢	3.95¢			3.95¢		4.05¢	3.95¢			4.11¢	4.466¢	4.406¢
Long ternes[2] (10 gage)	4.05¢		4.05¢											4.566¢	4.506¢
STRIP Hot-rolled[3]	2.80¢	2.80¢	2.80¢	2.80¢[15]	2.80¢		2.80¢					3.60¢[16]	2.96¢	3.318¢	3.256¢
Cold-rolled[4]	3.55¢	3.65	3.65¢	3.55¢			3.55¢			(Worcester = 3.75¢)			3.71¢	4.066¢	4.006¢
Cooperage stock	3.10¢	3.10¢			3.10¢		3.10¢							3.616¢	
TINPLATE Cokes, 1.50 lb[5], base box	$6.80	$6.80	$6.80		$6.90			$6.90	$6.90	(Warren, Ohio = $6.80)				$7.248	$7.140
Electro, box 0.25 lb	Deduct $1.00 from 1.50 lb coke base box price.														
Electro, box 0.50 lb	Deduct 80¢ from 1.50 lb coke base box price.														
Electro, box 0.75 lb	Deduct 60¢ from 1.50 lb coke base box price.														
TERNES, MFG., special coated	Deduct 90¢ from 1.50 lb coke base box price.														
BLACKPLATE, CANMAKING 55 lb to 70 lb	Deduct $1.60 from 1.50 lb coke base box.														
BLACKPLATE, CANMAKING 75 lb to 95 lb	Deduct $1.70 from 1.50 lb coke base box.														
BLACKPLATE, CANMAKING 100 lb to 128 lb	Deduct $1.60 from 1.50 lb coke base box.														
BLACKPLATE, h. e. 29 ga[11]	4.75¢	4.75¢	4.75¢		4.85¢			4.85¢	4.85¢					5.198¢	5.090¢
BARS Carbon steel	2.90¢	2.90¢	2.90¢	2.90¢	2.90¢	2.90¢	2.90¢					3.625¢[16]	3.06¢	3.35¢	3.356¢
Rail steel[6]	Subject to negotiation because of fluctuating scrap prices.														
Reinforcing (billet)[7]	2.75¢	2.75¢	2.75¢	2.75¢	2.75¢	2.75¢	2.75¢	2.75¢				3.325¢[16]		3.098¢	2.990¢
Reinforcing (rail)	Subject to negotiation because of fluctuating scrap prices.														
Cold-finished[8]	3.55¢	3.55¢	3.55¢	3.55¢		3.55¢							3.71¢	4.00¢	4.006¢
Alloy, hot-rolled	3.30¢	3.30¢	3.30¢			3.30¢	3.30¢	(Bethlehem, Massillon, Canton = 3.30¢)							3.432¢
Alloy, cold-drawn	4.10¢	4.10¢	4.10¢	4.10¢		4.10¢			(Canton = 4.10¢)						
PLATE Carbon Steel[12]	2.95¢	2.95¢	2.95¢	2.95¢	2.95¢		2.95¢	(Coatesville = 3.45¢, Claymont = 3.65¢, Geneva, Utah = 3.10¢) 2.95¢				3.838¢[14]		3.298¢	3.190¢
Floor plates	4.20¢	4.20¢		4.20¢										4.716¢	4.656¢
Alloy	3.80¢	3.80¢	3.80¢		(Coatesville = 4.80¢)									4.316¢	4.256¢
SHAPES, Structural	2.80¢	2.80¢	2.80¢		2.80¢	2.80¢	(Geneva, Utah = 2.95¢, Bethlehem = 2.80¢)					3.43¢[10]		3.040¢	2.932¢
SPRING STEEL, C-R 0.08 to 0.40 carbon	3.55¢			3.55¢			(Worcester = 3.75¢)								
0.41 to 0.60 carbon	5.05¢			5.05¢			(Worcester = 5.25¢)								
0.61 to 0.80 carbon	5.65¢			5.65¢			(Worcester = 5.85¢)								
0.81 to 1.05 carbon	7.15¢			7.15¢			(Worcester = 7.35¢)								
1.06 to 1.35 carbon	9.45¢			9.45¢			(Worcester = 9.65¢)								
MANUFACTURERS' WIRE[9] Bright	3.55¢	3.55¢		3.55¢	3.55¢		(Worcester = 3.65¢, Duluth = 3.60¢)					4.56¢[13]		4.022¢	4.006¢
Galvanized	Add proper size extra and galvanizing extra to Bright Wire Base														
Spring (high carbon)	4.60¢	4.60¢		4.60¢	(Worcester = 4.70¢, Duluth = 4.85¢) (Trenton = 4.85¢)							5.737¢[13]		5.072¢	4.964¢
PILING, Steel sheet	3.30¢	3.30¢				3.30¢								3.75¢	3.756¢

CORROSION AND HEAT RESISTANT STEELS

In cents per pound, f.o.b. basing point

Basing Point	Chromium Nickel		Straight Chromium			
	No. 304	No. 302	No. 410	No. 430	No. 442	No. 446
Ingot, P'gh, Chi, Canton, Balt, Reading, Ft. Wayne, Phila.	Subject to negotiation			Subject to negotiation		
Blooms, P'gh, Chi, Canton, Phila, Reading, Ft. Wayne, Balt.	Subject to negotiation			Subject to negotiation		
Slabs, P'gh, Chi, Canton, Balt, Phila, Reading	Subject to negotiation			Subject to negotiation		
Billets, P'gh, Chi, Canton, Watervliet, Syracuse, Balt, Beth.	Subject to negotiation			Subject to negotiation		
Billets, forging, P'gh, Chi, Canton, Dunkirk, Balt, Phila, Reading, Water, Syracuse, Ft. Wayne, Titusville, Beth, Brackenridge	23.00	22.50	17.50	17.50	21.00	25.50
Bars, h-r, P'gh, Chi, Canton, Dunkirk, Watervliet, Syracuse, Balt, Phila, Reading, Ft. Wayne, Titusville, Beth, Brackenridge	27.50	26.00	20.50	21.00	24.50	30.00
Bars, c-f, P'gh, Chi, Cleve, Canton, Dunkirk, Syracuse, Balt, Phila, Reading, Ft. Wayne, Watervliet, Beth, Brackenridge	27.50	26.00	20.50	21.00	24.50	30.00
Plates, P'gh, Middletown, Canton, Brackenridge, Balt, Coatesville	31.50	29.50	23.50	24.00	28.00	33.00
Shapes, structural, P'gh, Chi, Brackenridge	27.50	26.00	20.50	21.00	24.50	30.00
Sheets, P'gh, Chi, Middletown, Canton, Balt, Brackenridge	39.00	37.00	29.00	31.50	35.50	39.50
Strip, h-r, P'gh, Chi, Reading, Canton, Youngstown	25.50	23.50	18.50	19.00	28.00	38.00
Strip, c-r, P'gh, Cleve, Jersey City, Reading, Canton, Youngstown, Balt, W. Leechburg	32.50	30.50	24.00	24.50	35.00	56.50
Wire, c-d, Cleve, Dunkirk, Syracuse, Balt, Reading, Canton, P'gh, Newark, N. J., Phila, Ft. Wayne, Brackenridge	27.50	26.00	20.50	21.00	24.50	30.00
Wire, flat, c-r, Cleve, Balt, Reading, Dunkirk, Canton, W. Leechburg	32.46	30.30	23.80	24.34	34.82	56.26
Rod, h-r, Syracuse	27.05	25.97	20.02	20.56	24.34	28.75
Tubing, seamless, P'gh, Chi, Canton, Brackenridge, Milwaukee	72.09	72.09	.....	68.49	.....	.....

TOOL STEEL

*(F.o.b. Pittsburgh, Bethlehem, Syracuse, Dunkirk. *Also Canton, Ohio)*

W	Cr	V	Mo	Co		Base per lb
18	4	1	—	—	....	$2¢
18	4	1	—	5	....	$1.29
18	4	2	—	—	....	93¢
1.5	4	1.5	8	—	....	59¢
6	4	2	6	—	....	63¢

High-carbon-chromium* .. .. 47¢
Oil hardening manganese* ..... 26¢
Special carbon* ..... 24¢
Extra carbon* ..... 20¢
Regular carbon* ..... 17¢

Warehouse prices on and east of Mississippi are 2¢ per lb higher; west of Mississippi, 4¢ higher.

ELECTRICAL SHEETS

Base, all grades f.o.b. Pittsburgh

	Per lb
Armature	4.80¢ to 5.05¢
Electrical	5.30¢ to 5.55¢
Motor	6.05¢ to 6.30¢
Dynamo	6.75¢ to 7.50¢
Transformer 72	7.25¢ to 8.25¢
Transformer 65	7.95¢ to 9.20¢
Transformer 58	8.65¢ to 9.90¢
Transformer 52	9.45¢ to 9.70¢

F.o.b. Chicago and Gary: armature through motor only. F.o.b. Granite City add to lower quotation 0.45¢ for armature through & 72, and 0.35¢ for balance.

RAILS, TRACK SUPPLIES

(F.o.b. mill)

Standard rails, heavier than 60 lb
No. 1 O.H., per 100 lb $2.75
Angle splice bars, 100 lb 3.85
(F.o.b. basing points) *per 100 lb*
Light rails (from billets) $3.10

	Base per lb
Cut spikes	4.85¢
Screw spikes	6.90¢
Tie plate, steel	3.65¢
Tie plates, Pittsburg, Calif.	3.80¢
Track bolts	7.00¢
Track bolts, heat treated, to railroads	7.25¢

Basing points, light rails, Pittsburgh, Birmingham; cut spikes and tie plates—Pittsburgh, Chicago, St. Louis, Kansas City, Minnequa, Colo.; Birmingham; tie plates alone—Steelton, Pa., Buffalo. Cut spikes alone—Youngstown, Lebanon, Pa.; Richmond.

ROOFING TERNEPLATE

(F.o.b. Pittsburgh, 112 sheets)

	20x14 in.	20x28 in.
8-lb coating I.C. . . .	$7.05	$14.10

CLAD STEEL

Base prices, cents per pound

Stainless-clad	Plate	Sheet
No. 304, 20 pct, f.o.b. Pittsburgh, Washington, Coatesville, Pa.	*24.00	*22.00
Nickel-clad 10 pct, f.o.b. Coatesville, Pa.	21.50	....
Inconel-clad 10 pct, f.o.b. Coatesville	30.00	....
Monel-clad 10 pct, f.o.b. Coatesville	24.00	....
Aluminized steel Hot dip, 20 gage, f.o.b. Pittsburgh	....	9.00

* Includes annealing and pickling, or sandblasting.

MERCHANT WIRE PRODUCTS

To the dealer, f.o.b. Pittsburgh, Chicago, Birmingham

	Base Column	San Francisco
Standard & coated nails*	94	115
Galvanized nails*	94	115
Woven wire fence†	100	123
Fence posts, carloads††	105	...
Single loop bale ties	99	123
Galvanized barbed wire**	113	133
Twisted barbless wire ..	113	...

* Also Duluth; Worcester, 6 columns higher. † 15½ gage and heavier. ** On 80-rod spools, in carloads. †† Pittsburgh, Duluth only.

	Base per 100 lb	San Francisco
Annealed fence wire ‡ ..	$4.20	$5.21
Annealed, galv. fencing ‡	4.65	5.66
Cut nails, carloads ‡‡ ..	6.30	...

‡ Add 10¢ at Worcester. ‡‡ Pittsburgh only, less 20¢ to jobbers.

HIGH STRENGTH, LOW ALLOY STEELS

base prices, cents per pound

Steel	Alde-cor	Corten	Double Strength No. 1	Dyn-alloy	HI Steel	Mayari R	Otis-colloy	Yoloy	NAX High Tensile
Producer	Republic	Carnegie-Illinois, Republic	Republic	Alan Wood	Inland	Bethlehem	Jones & Laughlin	Youngstown Sheet & Tube	Great Lakes Steel
Plates	4.55	4.55	4.55	4.55	4.55	4.55	4.55	4.55	4.55
Sheets									
Hot-rolled	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30
Cold-rolled	5.30	5.30	5.30	..	.30	5.30	5.30	5.30	5.30
Galvanized		6.00	....	..	....	6.00	....	....	....
Strip									
Hot-rolled	4.30	4.30	4.30	....	4.30	4.30	4.30	4.30	4.30
Cold-rolled	....	....	5.30	....	....	5.30	5.30	5.30	5.30†
Shapes	....	4.30		....	4.30	4.30	4.30	4.30	....
Beams	....	4.30	....	....	....	4.30	....	....	....
Bars									
Hot-rolled	4.45	4.45	4.45	....	....	4.45	4.45	4.45	4.45
Bar shapes	....	4.45	....	....	4.45	4.45	4.45	4.45	....

† Pittsburgh, add 0.10¢ at Chicago and Gary.

PIPE AND TUBING

Base discounts, f.o.b. Pittsburgh and Lorain, steel buttweld and seamless. Others f.o.b. Pittsburgh only
Base price, $200.00 per net ton

Standard, threaded & coupled

Steel, buttweld	Black	Galv.
½-in.	47	29½
¾-in.	50	33½
1-in.	52½	36½
1¼-in.	53	37
1½-in.	53½	37½
2-in.	54	38
2½ and 3-in.	54½	38½
Wrought Iron, buttweld		
½-in.	+11	+35
¾-in.	+ 1½	+25
1 and 1¼-in.	4	+16½
1½-in.	9½	+13
2-in.	10	+12½
Steel, lapweld		
2-in.	44½	28
2½ and 3-in.	48½	32
3½ to 6-in.	50½	34
Steel, seamless		
2-in.	43½	27
2½ and 3-in.	46½	30
3½ to 6-in.	48½	32
Wrought Iron, lapweld		
2-in.	1½	+20
2½ to 3½-in.	4	+16
4-in.	8	+10½
4½ to 8-in.	6	+12

Extra Strong, plain ends

Steel, buttweld		
½-in.	46	30
¾-in.	50	34
1-in.	52	37
1¼-in.	52½	37½
1½-in.	53	38
2-in.	53½	38½
2½ and 3-in.	54	39
Wrought Iron, buttweld		
½-in.	+ 6½	+29
¾-in.	+ ½	+23
1 and 1¼ in.	4	+16½
2-in.	10	+12½
Steel, lapweld		
2-in.	43½	28
2½ and 3-in.	48½	33
3½ to 6-in.	52	36½
Steel, seamless		
2-in.	42½	27
2½ and 3-in.	46½	31
3½ and 6-in.	50	34½
Wrought Iron, lapweld		
2-in.	4½	+16½
2½ to 4-in.	13	+ 6
4½ to 6-in.	9	+10½

Basing discounts for standard pipe are for threads and couplings. For threads only, buttweld, lapweld and seamless pipe, one point higher discount (lower price) applies. For plain ends, buttweld, lapweld and seamless pipe 3-in. and smaller, three points higher discount (lower price) applies, while for lapweld and seamless 3½-in. and larger four points higher discount (lower price) applies. F.o.b. Gary prices are one point lower discount on all buttweld. On buttweld and lapweld steel pipe, jobbers are granted a discount of 5 pct. On l.c.l. shipments, prices are determined by adding 25 pct and 30 pct and the carload freight rate to the base card.

BOILER TUBES

Seamless steel and electric welded commercial boiler tubes and locomotive tubes, minimum wall. Net base prices per 100 ft, f.o.b. Pittsburgh in carload lots, cut length 4 to 24 ft, inclusive.

OD	Gage	Seamless		Electric Weld	
in in.	BWG	Hot-Rolled	Cold-Drawn	Hot-Rolled	Cold-Drawn
2	13	$17.84	$20.99	$17.30	$20.36
2½	12	23.99	28.21	23.27	27.36
3	12	26.68	31.40	25.88	30.46
3½	11	33.35	39.26	32.35	38.08
4	10	41.40	48.70	40.16	47.24

CAST IRON WATER PIPE

Per net ton

6-in. to 24-in. del'd Chicago $91.12
6-in. to 24-in. del'd New York 89.18
6-in. to 24-in., Birmingham 79.50
6-in. and larger, f.o.b. cars, San Francisco, Los Angeles for all rail shipment; rail and water shipment less 105.90
Class "A" and gas pipe, $5 extra; 4-in. pipe is $5 a ton above 6-in.

BOLTS, NUTS, RIVETS, SET SCREWS

Consumer Prices

(Bolts and nuts f.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

Base discount less case lots

Machine and Carriage Bolts

	Percent Off List
½ in. & smaller x 6 in. & shorter	45
9/16 & ⅝ in. x 6 in. & shorter	46
¾ in. & larger x 6 in. & shorter	43
All diam, longer than 6 in.	41
Lag, all diam over 6 in. long	44
Lag, all diam x 6 in. & shorter	46
Plow bolts	54

Nuts, Cold Punched or Hot Pressed

(Hexagon or Square)

½ in. and smaller	43
9/16 to 1 in. inclusive	42
1⅛ to 1½ in. inclusive	40
1⅝ in. and larger	35

On above bolts and nuts, excepting plow bolts, additional allowance of 15 pct for full container quantities. There is an additional 5 pct allowance for carload shipments.

Semifin. Hexagon Nuts	USS	SAE
7/16 in. and smaller	..	46
½ in. and smaller	44	..
½ in. through 1 in.	..	44
9/16 in. through 1 in.	43	..
1⅛ in. through 1½ in.	41	42
1⅝ in. and larger	35	..

In full case lots, 15 pct additional discount. For 200 lb or more, freight allowed up to 50¢ per 100 lb, based on Cleveland, Chicago, Pittsburgh.

Stove Bolts

Packages, nuts separate ..... 65 and 10
In bulk 75

On stove bolts freight allowed up to 65¢ per 100 lb based on Cleveland, Chicago, New York on lots of 200 lb or over.

Large Rivets *(½ in. and larger)*
Base per 100 lb

F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham $5.65
F.o.b. Lebanon, Pa. 5.80

Small Rivets *(7/16 in. and smaller)*
Percent Off List

F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham 55

Cap and Set Screws
(In packages) *Percent Off List*

Hexagon head cap screws, coarse or fine thread, up to and incl. 1 in. x 6 in., SAE 1020, bright	53
¾ to 1 in. x 6 in., SAE 1035, heat treated	44
Set screws, oval points	56
Milled studs	29
Flat head cap screws, listed sizes	16
Fillister head cap, listed sizes	37

Freight allowed up to 65¢ per 100 lb based on Cleveland, Chicago or New York on lots of 200 lb or over.

FLUORSPAR

Metallurgical grade, f.o.b. producing plant.

Effective CaF_2 Content:	*Base price per short ton*
70% or more	$35.00
65% but less than 70%	34.00
60% but less than 65%	33.00
Less than 60%	32.00

LAKE SUPERIOR ORES

(51.50% Fe, Natural Content, Delivered Lower Lake Ports)

	Per Gross Ton
Old range, bessemer	$5.95
Old range, nonbessemer	5.80
Mesabi, bessemer	5.70
Mesabi, nonbessemer	5.55
High phosphorus	5.55

Above prices were for 1947 season.

METAL POWDER

Prices in cents per pound in ton lots f.o.b. shipping point.

Brass, minus 100 mesh	24¢ to 28½¢
Copper, electrolytic, 100 and 325 mesh	30⅝¢ to 34¾¢
Copper, reduced, 150 and 200 mesh	30½¢ to 32¢
Iron, commercial, 100, 200, 325, mesh 96 + % Fe carlots	11.5¢ to 14.5¢
Swedish sponge iron, 100 mesh, c.l.f. N. Y., carlots, ocean bags	7.4¢ to 8.5¢
Domestic sponge iron, minus 48 mesh	10¢
Iron, crushed, 200 mesh and finer, 90 + % Fe carload lots	5¢
Iron, hydrogen reduced, 300 mesh and finer, 98 + % Fe, drum lots	63¢ to 80¢
Iron, electrolytic, unannealed, 325 mesh and coarser, 99 + % Fe	44¢
Iron, electrolytic, annealed, 100, minus 200 mesh	17¢ to 21¢
Iron, electrolytic, annealed minus 100 mesh, 99 + % Fe	39½¢
Iron carbonyl, 300 mesh and finer, 98-99.8 + % Fe	90¢ to $1.75
Aluminum, 100, 200 mesh, carlots	23¢ to 29¢
Antimony, 100 mesh	44¢
Cadmium, 100 mesh	$2.00
Chromium, 100 mesh and finer	$1.025
Lead, 100, 200 & 300 mesh	20½¢ to 25½¢
Manganese, minus 325 mesh and coarser	59¢
Nickel, 100 mesh	51½¢
Silicon, 100 mesh	29¢
Solder powder, 100 mesh	8½¢ plus metal
Stainless steel, 302, minus 100 mesh	75¢
Tin, 100 mesh	90¢
Tungsten metal powder, 98%-99%, any quantity, per lb	$2.90
Molybdenum powder, 99%, in 100-lb kegs, f.o.b. York, Pa., per lb	$2.65
Under 100 lb	$2.90

COKE

Furnace, beehive (f.o.b. oven) Net Ton	
Connellsville, Pa.	$12.00 to $13.00
Foundry, beehive (f.o.b. oven)	
Connellsville, Pa.	13.50 to 14.50
Foundry, Byproduct	
Chicago, del'd	$18.60
Chicago, f.o.b.	17.50
New England, del'd	20.40
Seaboard, Kearney, N. J., f.o.b.	17.85
Philadelphia, f.o.b.	17.75
Swedeland, Pa., f.o.b.	17.75
Buffalo, del'd	20.15
Ashland, Ohio, f.o.b.	15.50
Painesville, Ohio, f.o.b.	16.60
Erie, del'd	19.95
Cleveland, del'd	17.90
Cincinnati, del'd	18.59
St. Louis, del'd	18.03
Birmingham, del'd	15.76

REFRACTORIES

(F.o.b. Works)

Fire Clay Brick *Carloads, Per 1000*

No. 1 Ohio	$67.00
First quality, Pa., Md., Ky., Mo., Ohio	73.00
First quality, New Jersey	78.00
Sec. quality, Pa., Md., Ky., Mo., Ohio	67.00
Sec. quality, New Jersey	70.00
No. 2 Ohio	59.00
Ground fire clay, net ton, bulk	10.50

Silica Brick

Pennsylvania and Birmingham	$73.00
Chicago District and Alabama	82.00
Silica cement, net ton (Eastern)	12.50
East Chicago	13.50

Chrome Brick *Per Net Ton*

Standard chemically bonded, Balt., Plymouth Meeting, Chester	$64.00

Magnesite Brick

Standard, Balt. and Chester	$86.00
Chemically bonded, Baltimore	75.00

Grain Magnesite
std. ⅜-in. grains

Domestic, f.o.b. Balt. and Chester in bulk, fines removed	$51.50
Domestic, f.o.b. Chewelah, Wash., in bulk with fines	27.00
in sacks with fines	31.50

Dead Burned Dolomite

F.o.b. producing points in Pennsylvania, West Virginia and Ohio, per net ton, bulk. Midwest, add 10¢: Missouri Valley, add 20¢ $11.06

WAREHOUSE PRICES

Base prices, delivered metropolitan areas, per 100 lb.

CITIES	SHEETS			STRIP		PLATES	SHAPES	BARS		ALLOY BARS			
	Hot-Rolled	Cold-Rolled (15 gage)	Galvanized (10 gage)	Hot-Rolled	Cold-Rolled		Standard Structural	Hot-Rolled	Cold-Finished	Hot-Rolled, A 4615 As-rolled	Hot-Rolled, A 4140-50 Ann.	Cold-Drawn, A 4615 As-rolled	Cold-Drawn, A 4140-50 Ann.
Philadelphia	$4.51	$5.78	$5.91	$4.83	$5.73	$4.86	$4.57	$4.88	$5.58	$8.52	$8.67	$10.13	$10.28
New York	4.76	5.78[1]	6.16	5.09	6.07	5.11	4.80	5.08	5.63	8.58	8.73	10.18	10.33
Boston	4.83	5.69	6.23[12]	5.61	6.87	5.18	4.91	5.04	5.69	8.20	8.35	9.50	9.65
Baltimore	4.33	....	5.73	4.81	....	4.78	4.73	4.86	5.56	....	....	....	....
Norfolk	4.90	....	....	5.30	....	5.15	5.15	5.20	6.00	....	....	....	....
Chicago	4.25	5.10	5.65	4.35	5.45	4.60	4.40	4.40	5.10	8.20	8.35	9.50	9.65
Milwaukee	4.458	5.308	5.858	5.058	5.658	4.808	4.608	4.608	5.395	8.495	8.795	9.945	10.095
Cleveland	4.25	5.10[1]	5.81	4.55	....	4.60†	4.68	4.40	5.10	8.51	8.66	9.50	9.65
Buffalo	4.25	5.10	6.05	5.25	5.70[5]	5.00	4.40‡	4.40‡	5.10	8.20	8.35	9.50	9.65
Detroit	4.10	5.26	6.07	4.77	5.67	4.92†	4.82	4.56–4.82	5.26	8.82	8.97	10.09	10.24
Cincinnati	4.55	5.21	5.76	4.79	5.74	4.99	4.84	4.79	5.49	8.73	8.88	10.04	10.19
St. Louis	4.61	5.46	6.07	4.71	5.87	4.96	4.76	4.76	5.52	8.77	8.92	10.07	10.22
Pittsburgh	4.25	5.10[1]	5.65	4.35	....	4.60	4.40	4.40	5.10	8.20	8.37	9.50	9.65
St. Paul	4.68	5.53	6.08	4.78	....	5.03	4.83	4.83	6.00	....	....	....	....
Omaha	5.262	....	6.712	5.362	....	5.612	5.412	5.412	6.112	....	....	....	....
Indianapolis	4.59	5.36	5.91	4.69	5.79	4.94	....	4.74	5.44	....	....	....	....
Birmingham	4.45[11]	....	5.80	4.45[11]	....	4.65[11]	4.40[11]	4.40[11]	6.13	....	....	....	....
Memphis	4.88[11]	5.94[1]	6.43	5.08[11]	....	5.23[11]	5.03[11]	5.03[11]	5.94	....	....	....	....
New Orleans	*5.05[11]	6.39[1]	....	5.25[11]	....	5.40[11]	*5.10[11]	*5.20[11]	6.39[5]	....	....	....	....
Houston	5.75[9]	....	7.36	6.00[9]	....	5.85[9]	5.85[9]	5.35[17]	7.00	9.40	9.25	10.40	10.55
Los Angeles	5.75	7.35[1]	7.40	6.05	8.70[5]	5.55	5.35	5.50	7.35[14]	9.70[15]	9.55[15]	11.15[15]	11.30[15]
San Francisco	5.40[8]	6.65	7.05	5.75[8]	8.70	5.50	5.20	5.05	7.50	9.70[15]	9.55[15]	11.15[15]	11.30[15]
Seattle	5.45[4]	7.25[2]	6.85	5.60[4]	....	5.60[4]	5.25[4]	5.45[4]	7.45[14]	....	8.95[16]	....	11.30[15]
Portland	5.30[4]	7.10[2]	6.70	5.60[4]	....	5.45[4]	5.25[4]	5.55[4]	7.45[14]	....	....	....	....
Salt Lake City	6.40	....	7.85	6.70	....	6.20	6.35	6.55	7.55	....	....	....	....

BASE QUANTITIES

Standard unless otherwise keyed on prices.

HOT-ROLLED: Sheets, strip, plates, shapes and bars, 400 to 1999 lb.

COLD-ROLLED: Sheets, 400 to 1999 lb; strip, extras on all quantities; bars 1000 lb and over.

ALLOY BARS: 1000 to 1999 lb.

GALVANIZED SHEETS: 450 to 1499 lb.

EXCEPTIONS: (1) 400 to 1499 lb; (2) 450 to 1499 lb; (3) 300 to 4999 lb; (4) 300 to 9999 lb; (5) 2000 lb and over; (6) 1000 lb and over; (7) 400 to 14,999 lb; (8) 400 lb and over; (9) 500 to 1999 lb; (10) 500 to 999 lb; (11) 400 to 3999 lb; (12) 450 to 3749 lb; (13) 400 to 1999 lb; (14) 1500 lb and over; (15) 1000 to 4999 lb; (16) 4000 lb and over; (17) up to 1999 lb.

* Add 46¢ for sizes not rolled in Birmingham

† Up to ¾ in. thick and 90 in. wide.

‡ Add 40¢ for sizes not rolled at Buffalo.

PIG IRON PRICES

Dollars per gross ton. Delivered prices represent minimums. Delivered prices do not include 3 pct tax on freight.

BASING POINT* PRICES

Basing Point	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Bethlehem	40.00	40.50	41.00	41.50	.....
Birmingham	38.88	36.38-39.38	.....	.....	.....
Buffalo	40.00-44.00*	40.00-44.50*	40.50-45.00*	.....	.....
Chicago	38.50	39.00	39.50	40.00	.....
Cleveland	38.50-39.75*	39.00-40.25*	39.50-40.75*	.....	.....
Duluth	39.00	39.50	40.00	40.50	.....
Erie	38.50	39.00	39.50	40.00	.....
Everett		45.00	45.50	.....	.....
Granite City	39.50	40.00	40.50	.....	.....
Neville Island	39.00	39.50	39.50	40.00	.....
Provo	39.00	39.50			.....
Sharpsville	39.00	39.50	39.50	40.00	.....
Steelton	40.00	.....	.....	.....	46.00
Struthers, Ohio	39.50	.....	.....	.....	.....
Swedeland	45.00	45.50	46.00	46.50	.....
Toledo	38.50	39.00	39.50	40.00	.....
Troy, N. Y.	.....	.....	.....	.....	48.00
Youngstown	39.00	39.50	39.50	40.00	.....

DELIVERED PRICES† (BASE GRADES)

Consuming Point	Basing Point	Freight Rate	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Boston	Everett	$0.50 Arb.	.....	45.50	46.00	.....	.....
Boston	Steelton	5.78	45.78	.....	.....	.....	51.78
Brooklyn	Bethlehem	3.60	43.60	44.10	44.60	45.10	.....
Cincinnati	Birmingham	5.85	44.73	42.23-45.23	.....	.....	.....
Jersey City	Bethlehem	2.21	42.21	42.71	43.21	43.71	.....
Los Angeles	Provo	7.13	46.13	46.63	.....	.....	.....
Mansfield	Cleveland-Toledo	2.56	41.06-42.31*	41.56-42.81*	42.06-43.31*	42.56	.....
Philadelphia	Bethlehem	2.00	42.00	42.50	43.00	43.50	.....
Philadelphia	Swedeland	1.21	46.21	46.71	47.21	47.71	.....
Philadelphia	Steelton	2.59	42.59	.....	.....	.....	48.59
San Francisco	Provo	7.13	46.13	46.63	.....	.....	.....
Seattle	Provo	7.13	46.13	46.63	.....	.....	.....
St. Louis	Granite City	0.75 Arb.	40.25	40.75	41.25	.....	.....

* Republic Steel Corp. price. Basis: Average price of No. 1 hvy. mlt. steel scrap at Cleveland or Buffalo respectively as shown in last week's issue of THE IRON AGE. Price is effective until next Sunday midnight.

Basing point prices are subject to switching charges; silicon differential (not to exceed 50¢ per ton for each 0.25 pct silicon content in excess of base grade which is 1.75 to 2.25 pct); phosphorus differentials, a reduction of 38¢ per ton for phosphorus content of 0.70 pct and over; manganese differentials, a charge not to exceed 50¢ per ton for each 0.50 pct manganese content in excess of 1.00 pct. $2 per ton extra may be charged for 0.5 to 0.75 pct nickel content and $1 per ton extra for each additional 0.25 pct nickel.

Silvery iron (blast furnace) silicon 6.00 to 6.50 pct, C/L per g.t., f.o.b. Jackson, Ohio—$49.50; f.o.b. Buffalo—$50.75. Add $1.25 per ton for each additional 0.50 pct Si, up to 12 pct. Add 50¢ per ton for each 0.50 pct Mn over 1.00 pct. Add $1.00 per ton for 0.75 pct or more P. Bessemer ferrosilicon prices are $1.00 per ton above silvery iron prices of comparable analysis.

Charcoal pig iron base price for low phosphorus $55.00 per gross ton, f.o.b. Lyle, Tenn. Delivered Chicago, $62.46. High phosphorus charcoal pig iron is not being produced.

Ferromanganese

78-82% Mn, Maximum contract base price, gross ton, lump size, f.o.b. Baltimore, Philadelphia, New York, Birmingham, Rockwood, Tenn.

Carload lots (bulk) $145
Less ton lots (packed) 189.00
Delivered Pittsburgh 151.00

$1.80 for each 1% above 82% Mn; penalty, $1.80 for each 1% below 78%.

Briquets—Cents per pound of briquet, freight allowed, 66% contained Mn.

	Eastern	Central	Western
Carload, bulk ...	8.70	8.95	9.50
Ton lots	10.30	10.90	12.80
Less ton lots ...	11.20	11.80	13.70

Spiegeleisen

Contract prices, gross ton, lump, f.o.b. Palmerton, Pa.

	16-19% Mn 3% max. Si	19-21% Mn 3% max. Si
Carloads	$46.00	$47.00
F.o.b. Pittsburgh	50.00	51.00

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, f.o.b. shipping point, freight allowed, eastern zone.

96% min. mn, 0.2% max. C, 1% max. Si, 2% max. Fe.

Carload, bulk 32
L.c.l. lots 34

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.

Carloads 32
Ton lots 34
Less ton lots 36

Low-Carbon Ferromanganese

Contract price, cents per pound Mn contained, lump size, f.o.b. shipping point, freight allowed, eastern zone.

	Carloads	Ton	Less
0.07% max. C. 0.06% P, 90% Mn.	23.00	24.85	26.05
0.10% max. C.	22.50	24.35	25.55
0.15% max. C.	22.00	23.85	25.05
0.30% max. C.	21.50	23.35	24.55
0.50% max. C.	21.00	22.85	24.05
0.75% max. C., 7.00% max. Si.	18.00	19.85	21.05

Silicomanganese

Contract basis, lump size, cents per pound of metal, f.o.b. shipping point, freight allowed, 65-70% Mn, 17-20% Si, 1.5% max. C.

Carload bulk 7.80
Ton lots 9.45
Briquet, contract basis, carlots, bulk freight allowed, per lb of briquet 8.75
Ton lots 10.35
Less ton lots 11.25

Silvery Iron (electric furnace)

Si 14.01 to 14.50 pct, f.o.b. Keokuk, Iowa, openhearth $78.00, foundry, $79.00; $78.75 f.o.b. Niagara Falls; $77.50 f.o.b. Jackson, Ohio. Electric furnace silvery iron is not being produced at Jackson. Add $1.00 per ton for each additional 0.50% Si up to and including 18%. Add $1.00 per ton for each 0.50 pct Mn over 1 pct.

Silicon Metal

Contract price, cents per pound contained Si, lump size, f.o.b. shipping point, freight allowed, for ton lots packed.

	Eastern	Central	Western
96% Si, 2% Fe..	16.90	17.50	18.10
97% Si, 1% Fe..	17.30	17.90	18.50

Silicon Briquets

Contract price, cents per pound of briquet, bulk, f.o.b. shipping point, freight allowed to destination, 40% Si, 1 lb Si briquets.

	Eastern	Central	Western
Carload, bulk ...	5.25	5.50	5.70
Ton lots	6.85	7.45	7.75
Less ton lots ...	7.75	8.35	8.65

Electric Ferrosilicon

Contract price, cents per pound contained Si, lump size in carloads, f.o.b. shipping point, freight allowed.

	Eastern	Central	Western
25% Si	15.50	....	....
50% Si	9.30	9.80	10.00
75% Si	11.80	12.10	12.85
85% Si	13.30	13.60	14.35
90% Si	15.00	15.30	16.00

Ferrochrome (65-72% Cr, 2% max. Si)

Contract prices, cents per pound, contained Cr, lump size in carloads, f.o.b. shipping point, freight allowed.

	Eastern	Central	Western
0.06% C	26.50	26.90	27.00
0.10% C	26.00	26.40	26.50
0.15% C	25.50	25.90	26.00
0.20% C	25.25	25.65	25.75
0.50% C	25.00	25.40	25.50
1.00% C	24.50	24.90	24.75
2.00% C	24.25	24.65	24.75
65-69% Cr, 4.9% C	18.60	19.00	19.15
62-66% Cr. 4-6% C. 6-9% Si.	18.60	19.00	19.15

Briquets — Contract price, cents per pound of briquet, f.o.b. shipping point, freight allowed, 60% chromium.

	Eastern	Central	Western
Carload, bulk ...	12.50	12.75	12.85
Ton lots	14.00	14.90	15.50
Less ton lots....	14.90	15.80	16.40

High-Nitrogen Ferrochrome

Low-carbon type: 67-72% Cr, 0.75% N. Add 2¢ per lb to regular low carbon ferrochrome price schedule. Add 2¢ for each additional 0.25% N.

S. M. Ferrochrome

Contract price, cents per pound chromium contained, lump size, f.o.b. shipping point, freight allowed.

High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.

	Eastern	Central	Western
Carload	19.70	20.10	20.25
Ton lots	21.85	23.15	23.95
Less ton lots ...	23.35	24.65	25.45

Low carbon type: 62-66% Cr, 4-6% Si, 4-6% mn, 1.25% max. C.

	Eastern	Central	Western
Carload	25.00	25.40	25.50
Ton lots	27.30	27.95	29.15
Less ton lots ...	29.10	29.75	30.95

Chromium Metal

Contract prices, cents per lb, chromium contained carload packed, f.o.b. shipping point freight allowed, 97% min. Cr. 1% max. Fe.

	Eastern	Central	Western
0.20% max. C. ..	97.00	98.50	99.75
0.50% max. C. ..	93.00	94.50	95.75
9.00% min. C. ..	91.50	93.00	94.25

Calcium—Silicon

Contract price per lb of alloy, lump, f.o.b. shipping point, freight allowed.

30-35% Ca, 60-65% Si, 3.00% max. Fe r 28-32% Ca, 60-65% Si, 6.00% max. Fe.

	Eastern	Central	Western
Carloads	16.25	16.75	18.80
Ton lots	19.35	20.10	22.25
Less ton lots	20.85	21.60	23.75

Calcium—Manganese—Silicon

Contract prices, cents per lb of alloy, lump, f.o.b. shipping point, freight allowed.

16-20% Ca, 14-18% Mn, 53-59% Si.

	Eastern	Central	Western
Carloads	17.50	18.00	20.05
Ton lots	19.80	20.65	22.40
Less ton lots ...	20.80	21.65	23.40

Calcium Metal

Eastern zone contract prices, cents per pound of metal, f.o.b. shipping point, freight allowed. Add 1.5¢ for central zone; 3.5¢ for western zone.

	Cast Turnings	Distilled
Ton lots	$1.85	$2.70 $3.40
Less ton lots	2.20	3.05 4.20

CMSZ

Contract price, cents per pound of alloy, f.o.b. shipping point, freight allowed.

Alloy 4: 45-49% Cr, 4-6% Mn, 18-21% Si, 1.25-1.75% Zr, 3.00-4.5% C.

Alloy 5: 50-56% Cr, 4-6% Mn, 13.50-16.00% Si, 0.75 to 1.25% Zr, 3.50-500% C.

	Eastern	Central	Western
Ton lots	18.00	19.10	21.05
Less ton lots ...	19.25	20.35	22.30

SMZ

Contract price, cents per pound of alloy, f.o.b. shipping point, freight allowed. 60-65% Si, 5-7% Mn. 5-7% Zr, 20% Fe, ½ in. x 12 mesh.

	Eastern	Central	Western
Ton lots	15.75	16.85	18.80
Less ton lots ...	17.00	18.10	20.05

Other Ferroalloys

Ferrotungsten, standard, lump or ¼ x down, packed, f.o.b. plant Niagara Falls, Washington, Pa., York, Pa., per pound contained W, 5 ton lots, freight allowed... $2.25

Ferrovanadium, 35-55%, contract basis, f.o.b. plant, freight allowances, per pound contained V.

Openhearth $2.90
Crucible 3.00
High speed steel (Primos)... 3.10

Vanadium pentoxide, 88-92% V_2O_5 contract basis, per pound contained V_2 ..... $1.30

Ferrocolumbium, 50-60%, contract basis, f.o.b. plant, freight allowed, per pound contained Cb

Ton lots $2.50
Less ton lots $2.55

Ferromolybdenum, 55-75%, f.o.b. Langeloth, Washington, Pa., per pound contained Mo. ..... 95¢

Calcium molybdate, 40-45%, f.o.b. Langeloth, Washington, Pa., per pound contained Mo. ..... 80¢

Molybdenum oxide briquets, 48-52% Mo, f.o.b. Langeloth, Pa., per pound contained Mo..... 80¢

Molybdenum oxide in cans, f.o.b. Langeloth and Washington, Pa., per pound contained Mo..... 80¢

Ferrotitanium, 40-45%, 0.10% C max., f.o.b. Niagara Falls, N. Y., ton lots, per pound contained Ti $1.33
Less ton lots $1.35

Ferrotitanium, 20-25%, 0.10% C max., ton lots, per pound contained Ti $1.35
Less ton lots $1.40

High carbon ferrotitanium, 15-20%, 6-8% C, contract basis, f.o.b. Niagara Falls, freight allowed, carloads, per net ton.... $142.50

Ferrophosphorus, electrolytic, 23-26%, carlots, f.o.b. (Siglo) Tenn., $3 unitage per gross ton $65.00

Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.

Carload lots ..... 18.40¢

Zirconium, 12-15%, contract basis, lump, f.o.b. plant, freight allowed, per pound of alloy

Carload, bulk ..... 6.00¢

Alsifer, 20% Al, 40% Si, 40% Fe, contract basis, f.o.b. Suspension Bridge, N. Y.

Carload ..... 6.90¢
Ton lots ..... 7.40¢

Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound

Car lots ..... 9.50¢
Ton lots ..... 10.25¢

Boron Agents

Contract prices per pound of alloy, f.o.b. shipping point, freight allowed.

Ferroboron, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C.

Eastern	Central	Western
$1.20	$1.23	$1.21

Manganese—Boron 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C.

Ton lots ...	$1.89	$1.903	$1.935
Less ton lots	2.01	2.023	2.044

Nickel—Boron 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni.

Less ton lots..$1.80 $1.8125 $1.8445

Silcaz, contract basis, f.o.b. plant freight allowed, per pound.

Carload lots ..... 39.00¢

Grainal, f.o.b. Bridgeville, Pa., freight allowed, 50 lb and over.

No. 1 ..... 93¢
No. 6 ..... 63¢
No. 79 ..... 45¢

Bortram, f.o.b. Niagara Falls

Ton lots, per pound ..... 45¢
Less ton lots, per pound ..... 50¢

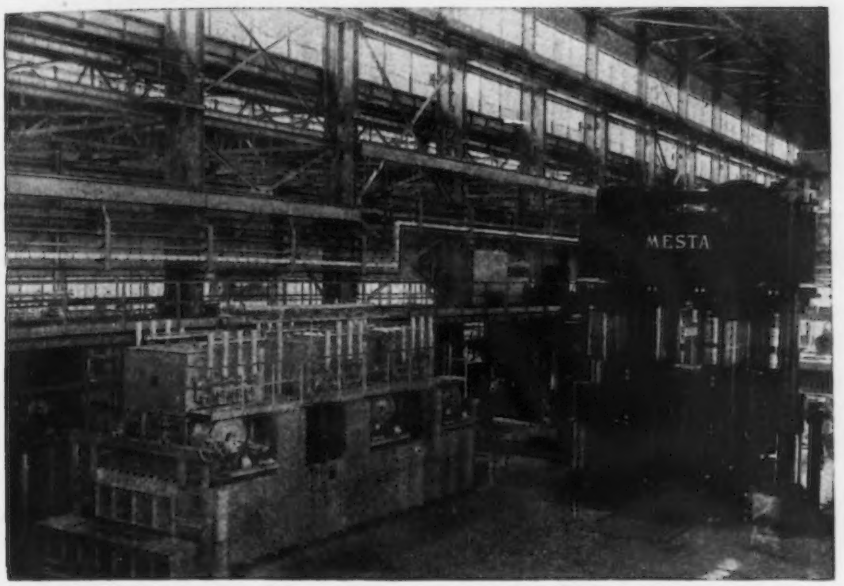
Carbortam, f.o.b., Suspension Bridge, N. Y., freight allowed, Ti 15-17%, B 0.90-1.15%, Si 2.5-3.0%, Al 1.0-2.0%.

Ton lots, per pound ..... 8.0¢

Borosil, f.o.b. Philo, Ohio, freight allowed, B 3%-4%, Si 40%-45%, per lb contained B..... $6.25

R-S FURNACE FACTS

ISSUED MONTHLY BY R-S PRODUCTS CORPORATION, PHILADELPHIA 44, PA., FOR THOSE CONCERNED WITH QUALITY HEATING OF METALS



The Diamond and the Brilliant look Alike!

. . . but they have a different value, for good and adequate reasons. It is so with the R-S Furnace compared with usual design. Note the sketch showing corner of a longitudinal roof section of an R-S Furnace with flat suspended arches. A is a buckstay, B the side wall, C the brick roof. The brick are drilled and carried on suspension rods indicated by arrows, 7 to 12 brick in each group.

There's a shrewd metal man named Joe Rice
Keeps a covey of talking white mice.
They tell him "For trouble,
With maintenance double,
Buy your furnaces purely on price."

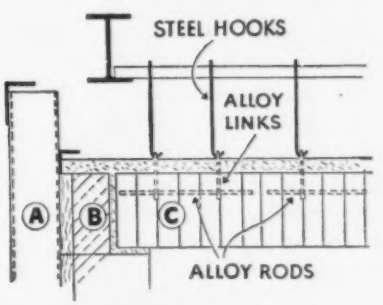
Of course, you won't go broke buying furnaces at the lowest bid. On the other hand, you will not get the *best* furnace (even when built to specifications) at the *lowest* prices.

Anything but the best will invite increased maintenance costs, which make a big hole in profits. In fact, the hole is bigger than the doughnut. A.I.S.E. figures prove that Maintenance is 3 times as big as Profits in the Steel industry. Everything you can save in Maintenance is a direct addition to Profits. A furnace that delivers full production year after year pays big dividends on the little extra it costs.

JMLco P-J1

In the ordinary furnace the steel suspension hooks pass through the brick and join directly to iron suspension rods. In R-S Furnaces for operation above 1500°F. the suspension hooks stop *at* the brickwork where they are protected from heat and will not scale. They are connected by heat-resistant *alloy steel links* to the suspension rods, and these too are made of alloy steel. No scale! No sag! No distortion! No falling roof! No unforeseen maintenance and no downtime for repairs!

It is these hidden characteristics of R-S design and construction which distinguish R-S Furnaces. Merely to meet specifications is not enough. We design and build into R-S Furnaces what *we know* they must have to do the work the customer expects. He usually forgets that he paid a little more for his R-S Furnace, but if he remembers it he knows why . . . it shows in his profits!



Section of Flat Suspended Arch

Handmaidens to a Monster

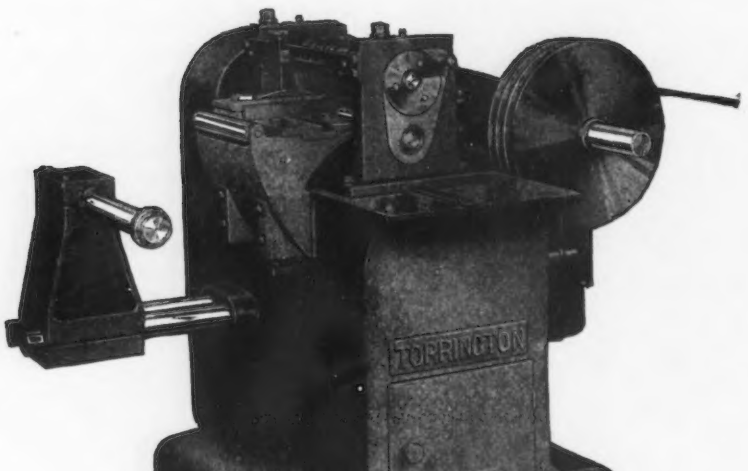
R-S has four furnaces, one shown at left, in the Wyman-Gordon plant at North Grafton, Massachusetts, to minister to the needs of this tremendous hydraulic die forging press. Magnesium and high aluminum alloy are its diet. Three of the R-S propane-fired apron-conveyor type furnaces prepare 13200 pounds per hour of heated billets at temperatures of 700° to 1000°F. within an accuracy of 2°. Each of these furnaces has a heating chamber 8 feet 6 inches wide and 39 feet long. Heat is supplied by forced convection with automatic temperature control in three zones. Each zone has an external air heating chamber and duplicate high volume motor-driven double-wall insulated fans. Air heaters and re-circulating fans are mounted on top of the furnace with catwalks at both sides giving ready access to the equipment for adjustment or maintenance.

Propane is the fuel. It burns in radiant tubes equipped with spark plugs for electric ignition. Air passes over the tubes, which are located in the external heating chambers, and then down through refractory ducts under the conveyor and into the heating chamber. It is then returned for re-heating. This method of heating precludes the possibility of damage to the surface of the billets from impact of combustion products. Air for combustion is supplied by a separate blower for each furnace. Temperature is automatically controlled. Recorders provide a continuous record of temperature in each heater and work zone. The recorders include switches to close the main fuel valve in case of excessive temperature.

When forging is finished in the giant press the parts go to a fourth R-S furnace for heat treating. This is a pusher type roller rail convection furnace. It operates from 1000° down to 250°F. with 4-zone automatic control. Heating and temperature control are handled as in the forging furnaces. Forgings to be heat treated are pushed through the furnace on 2 rows of steel trays on roller rails. Motor-driven rollers at the discharge end provide for quick movement from the furnace to the quench tank. This too has motor-driven rollers in addition to an air-operated elevator and steam heating coil. Water may be held in the temperature range of 100°F. to 250°F. Timers automatically control the duration of quench and the drain interval. Automatic hoists and conveyors move and unload the work and return the trays to the charging end of the furnace.

LOW COST
METAL SLITTING MACHINES

For Warehouse and other Short Run Requirements



The simplified design of the new Torrington Warehouse Metal Slitting Machines permits quick adjustment for any desired combination of cuts on any gauge metal within their ranges. Maximum capacity of the Model 1773 (illustrated) is 5 cuts (4 strips) .080" non-ferrous or .062" mild steel, or an equivalent number of additional cuts in thinner gauges up to 12" or 18" maximum trimmed width.

A larger size, the 1778, has a capacity of 5 cuts of .110" non-ferrous metal, or .093" mild steel, or equivalent. Built for 12", 18" or 24" maximum widths.

On both models, manual adjustment of the upper arbor is simple, and provides generous compensation for cutter wear.

Housings, payoff, winder and motor drive are mounted on a single welded steel base which reduces floor space to a minimum. Moving parts are well guarded for safety. The elimination of gearing by means of continuous roller chain drive assures smooth operation.

With this newest Torrington Slitter, you get engineering "know-how" that can only result from 60 years experience in designing and building auxiliary mill equipment.

The TORRINGTON MANUFACTURING COMPANY
TORRINGTON, CONNECTICUT

NEW EQUIPMENT

Continued from page 90

line which ranges from 3/64 to 15/32 in., and feature integral carbide shanks of ⅛, 3/16 and ¼-in. diam. *Severance Tool Industries Inc.*, Saginaw, Mich.

Trailer Compressor

ADDITION of a 160 cfm 2-wheel trailer unit to its 1948 compressor line is announced by *Davey Compressor Co.*, Kent, Ohio. The new unit features a 4-cylinder Davey V-type compressor and will be known as Air Chief Model 160-2 wheel. Perfect chassis balancing will provide for the same handling ease that is possible with 2-wheel trailers of smaller capacity, according to the manufacturer. The new unit is 153 in. long x 72 in. wide x 66 in. high.

Transformers

DRY type class B insulated load center transformers for plant power distribution circuits are being built by *Wagner Electric Corp.*, 6400 Plymouth Ave., St. Louis 14, in the following ratings: Three-phase, 60 cycle, 100 to 2000 kva, with high voltages of 2400, 4160, 4800, 7200, 12,000, 13,200, or 14,400, and low voltages of 600, 480, 240 or 208Y/120. Transformers are housed in paneled enclosures designed for indoor installation. Matching compartments for primary and secondary switchgear can be furnished as required, to form complete, closely-coupled unit substations.

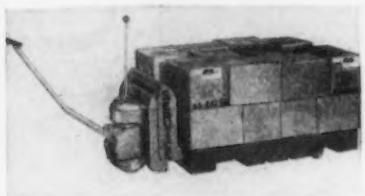
Constant Volume Pump

A LOW cost constant volume pump for 1000 psi service has been added to the line of hydraulic equipment manufactured by *Sundstrand Machine Tool Co.*, Rockford, Ill. This model 5W pump is made in eight different capacities ranging from 3 to 10 gpm at 1200 rpm and is suitable for material handling equipment, industrial heating units, lift trucks and similar installations. The pump incorporates the Rota-Roll pumping member design in which the smaller roller or inner member is keyed to a shaft and drives the outer member at a speed 25 pct lower than the speed of the motor. Differing from the conventional, the pumping members have a special tooth form of sturdier design which

provides longer pump life. With this design the rotating roller and rotor are self-emptying, thus eliminating turbulence and other interference with the smooth uniform flow of oil. Model 5W pump is suitable for direct coupling drive only.

Dumping Hopper

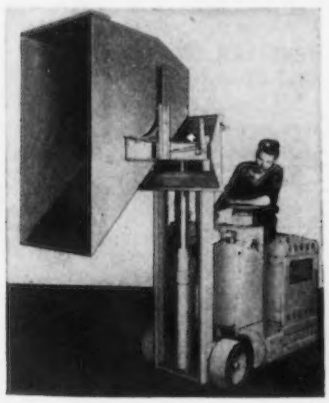
DESIGNED to handle all kinds of bulk materials such as small castings and scrap metals, a self-dumping hopper attachment applicable to Lewis-Shepard gas or electric power fork trucks has been



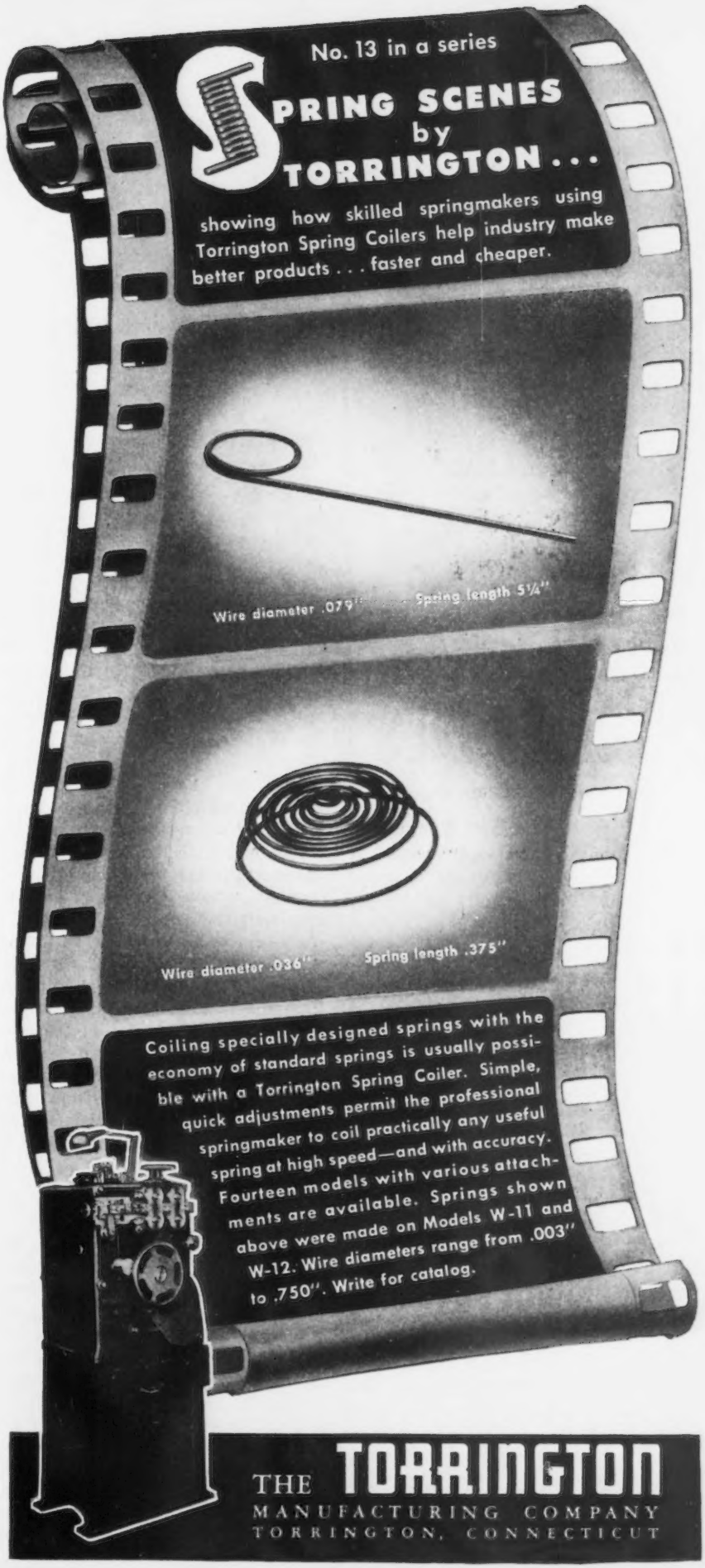
designed to float the truck frame over the bottom face of the pallet to prevent displacement when inserting the truck. A hand-operated release valve is provided to permit fast or slow lowering speed at the will of the operator. The unit, of pressed steel which is arc welded, is available in 4000-lb capacity. Lowered height is 3¼ in. and the lift is 4 in.; overall height is 27 in. It is available in fork lengths of 36, 42, 48, 54, and 60 in.

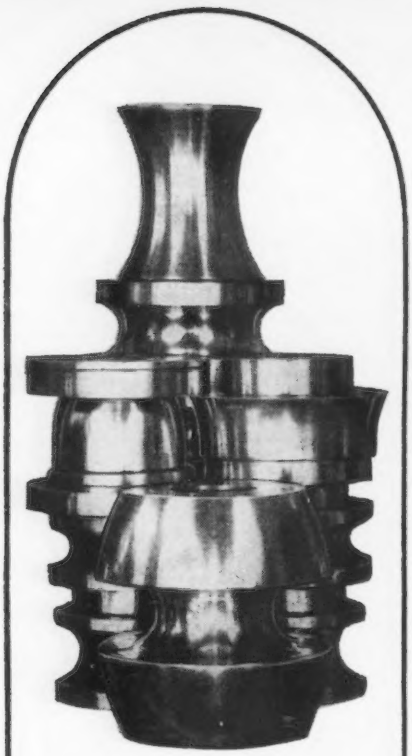
Lift Truck

DEVELOPMENT of a Leverlift truck for double faced pallet handling is announced by *Service Caster & Truck Corp.*, Albion, Mich. Features of the model include a set of toggle booster rollers



announced by *Lewis-Shepard Products, Inc.*, 282 Walnut St., Watertown 72, Mass. Operation of the hopper is completely controlled by the operator from his position on





High Grade
ROLLER DIES

made of tool steel, designed and manufactured by men who are first-class craftsmen.

The quality of your rolled production depends on the quality of your roller dies. Many manufacturers of COLD ROLLED FORMED PRODUCTS AND ELECTRIC WELDED TUBING compare quality, performance and cost, and wind up by placing orders with us. Naturally, you would like to know who uses our product. We will be glad to send you names of our distinguished customers on request. All inquiries will receive our immediate attention.

AMERICAN ROLLER DIE CORPORATION
(FORMERLY NATIONAL ROLL & MACHINE CO.)
20500 ST. CLAIR AVE.
CLEVELAND 17, OHIO

ARDCOR

the fork truck. To load the hopper the fork truck is maneuvered under the discharge orifice to receive the materials to be handled. At the discharge point, the hopper is elevated. Without leaving his position, the operator releases a holding latch, and the hopper dumps the load. The hopper returns itself to normal position and latches in an upright position. Constructed of steel, arc-welded for strength, the hopper is furnished in a range of cubic feet capacities depending on the materials to be handled, and upon the capacity of the fork truck with which it is to be used.

Portable Leak Detector

DESIGNED for production testing of hermetically sealed units as used in deep freezers, air conditioners and refrigerators, in which halogen compound is the refrigerant, a portable leak detector has been announced by *General Electric Co.*, Schenectady 5. Other applications of this instrument include locating leaks in tanks, boilers, piping and other closed systems into which halogen compounds can be introduced as a tracer. The detector is a hand-held probe with a pistol grip, having a metal nozzle with a plastic tip.

The unit contains a sensitive element which is responsive to halogens in the air, and a motor-driven blower which circulates the air through the sensitive element. A cable connects the detector unit to the control unit which contains the power supply, amplifier, indicating instrument and necessary controls. The nozzle is held ½ in. from the surface of the unit being tested. As it passes over a leak halogen vapor is drawn in, and as this vapor reaches the sensitive element, the increase in current is indicated on the milliammeter.

Induction Motors

THE Burke line of 2-pole, totally enclosed, fan cooled, squirrel-cage motors ranging from 250 to 500 hp have been redesigned, according to the *Burke Electric Co.*, Erie, Pa. These motors are described as normal starting torque, low starting current type, suitable for full voltage starting. They are rated 55C rise continuous and are available for 3 or 2-phase, 60 cycle, 440, 550 or 2300 v operation. This line has been especially designed for direct drive of high-speed blow-

WAREHOUSE STOCKS OF

ALLOY BARS

ROUNDS
SQUARES
HEXAGONS

Hot Rolled.
½" to 10" Rd.

Cold Drawn
⅛" to 4½" Rd.

⅜" to 2½" Hex.

AIRCRAFT

AMS—6260
6270
6272
6280
6322
6324
6415
6320 Hex.

BESSEMER

B1113

CARBON

1045 H.R.

FORGINGS

WRITE FOR OUR MONTHLY STOCK LIST

HY-ALLOY STEELS CO.
30 N. LASALLE
CHICAGO 2, ILL.
RAN 5253

GETTING HEAVY PROCESS EQUIPMENT THROUGH THE EYE OF A NEEDLE

Building steel plate fabricated equipment is only part of our job. Transporting that equipment to the customer's site often involves ingenious planning and meticulous attention to the details of loading.

Routing these bulky shipments through the varying clearance limitations imposed by the different railroads is, in many respects, like threading a needle. "Know how" makes the job easier and quicker.

The General American Plate & Welding Division Plant located at Sharon, Pa., has direct access to a number of heavy duty freight carriers. One of these railroads has the widest clearances of any road in the United States.

General American's "know how" in the transportation field is born of long years of experience in the operation of the largest fleet of privately owned tank cars in the world.

When you call on General American, you know you'll have a smooth running job from the preliminary planning stage to the day your new equipment is ready to operate.

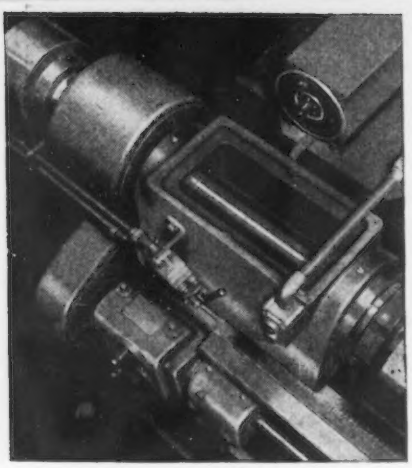
OTHER GENERAL AMERICAN EQUIPMENT

Annealing Covers
Bases—Welded
Bins
Charging Boxes
Pressure Vessels
Steel Stacks
Accumulator Tanks—High Pressure
Large Diameter Pipe and Mains
Pots—Tin or Galvanizing
Weldments
Steel and Alloy Plate Fabrication
Storage Tanks
oil—water—acid—propane—butane
Wiggins Conservation Structures

General American
TRANSPORTATION CORPORATION
process equipment • steel and alloy plate fabrication

SALES OFFICE: 10 East 49th St., Dept. 910a, New York 17, N. Y.
WORKS: Sharon, Pa., East Chicago, Ind.
OFFICES: Chicago, Sharon, Louisville, Orlando, Washington, D. C. Pittsburgh, St. Louis, Salt Lake City, Cleveland.

PLATE & WELDING DIVISION GENERAL AMERICAN TRADE MARK



Belt driven headstock contains no gears

NEW MANUFACTURING LATHE PRODUCES AT 2600 RPM

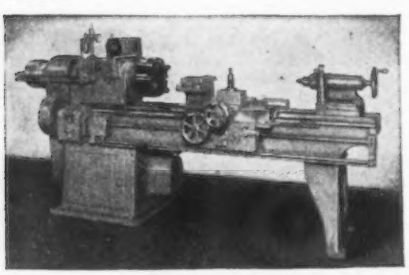
A special purpose manufacturing lathe which operates at 2600 rpm was developed recently by the R. K. LeBlond Machine Tool Co., Cincinnati 8, Ohio. The extremely high speed is achieved by means of a single-speed gearless headstock and a direct drive from the 10-hp motor to a special ball bearing mounted spindle.

Four speeds—2600, 1750, 1300, 875 rpm—are obtained through a drum switch.

This new lathe is designed for fast machining of non-ferrous metals where close tolerances and extremely smooth finish are essential. It is equipped with many other rapid production features: belt driven feed, automatic back facing attachment, hardened and ground steel bed ways, and air operated chuck.

Five of these machines — including an 1800-rpm model — were supplied at the request of one customer.

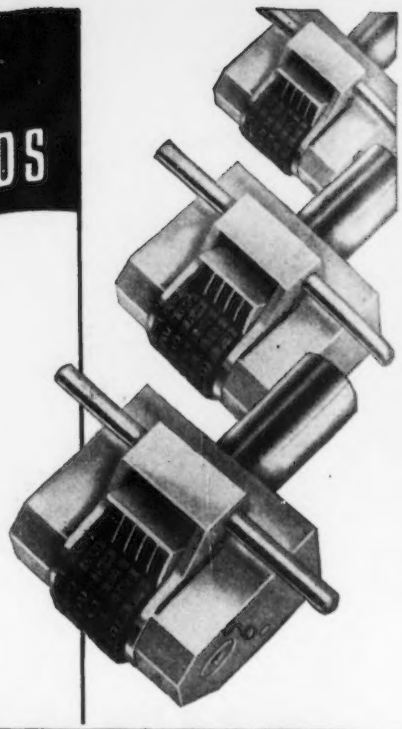
LeBlond special purpose lathes like these represent the most efficient and economical solution to difficult metal turning problems. For information on your requirements, address sales engineering department, the R. K. LeBlond Machine Tool Co., Cincinnati 8, Ohio.



NOBLEWEST

Automatic NUMBERING HEADS

Noblewest automatic numbering heads are guaranteed to be the finest obtainable. Produced from specially selected steel, every part is precision made by master craftsmen in a plant equipped with every modern facility. Standard models are available in any size numbers from 1/40″ to 1/2″. Special numbering heads are made to any requirements including embossing heads, and numbering heads combined with dies. Write to Noble & Westbrook Manufacturing Company, 22 Westbrook Street, East Hartford 8, Conn.



MARK IT BEST WITH NOBLEWEST IMPROVED MARKING DEVICES

NOBLEWEST

NEW EQUIPMENT

ers, pumps, compressors and other similar equipment in locations involving excessive moisture conditions or dust. The windings are enclosed and bearing brackets and external fans are enclosed within

an outer end shield which is said to direct the flow of air over the bearings and through the radiators within the outer shell, discharging it at the center opening. Double-end ventilation may be used. Split bearing brackets and split sleeve bearings are used. The 350 hp, 3600 rpm motor is shown.

PERSONALS

Continued from page 104

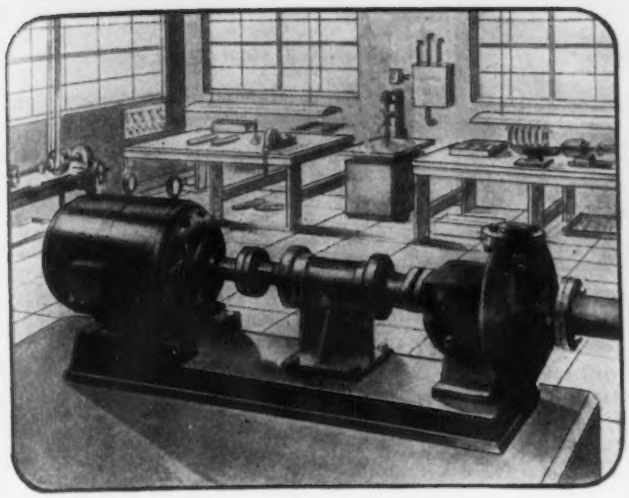
• **Theodore C. Froeberg** has been appointed district manager of the state of Iowa and the Tri-Cities territory by Size Control Co., division of American Gage & Machine Co., Chicago. **William C. Massow** has been appointed assistant sales manager in charge of press sales by Walsh Press & Die Co., also a division of American Gage & Machine Co.

• **Louis J. Cercone** has been appointed Western New York sales representative, engine and compressor division of the American Air Filter Co., Inc., with headquarters in Buffalo. He formerly was with the Maxim Silencer Co.

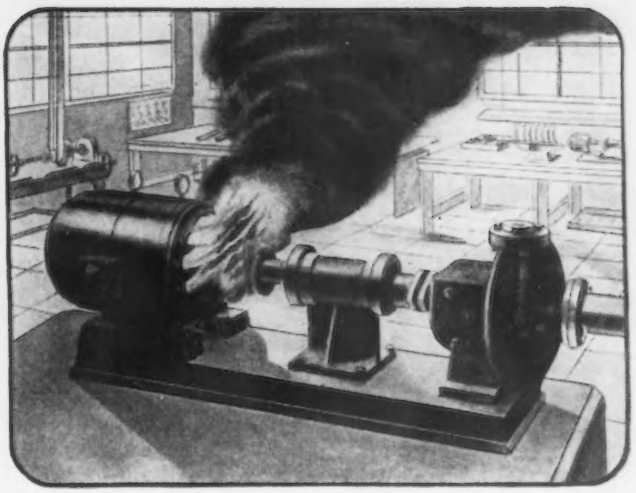
• **John J. Hart, Jr.** has been named sales manager of a recently-formed division of the Watson-Standard Co., Pittsburgh. He comes to Watson-Standard from the Lake Erie Engineering Corp.

• **W. Heath Talmadge** has been appointed general manager of the Economy Steel Co., Los Angeles.

(Advertisement)



Before a small motor—



can touch off a major fire—

CATCH THE FLAMES IN TIME

THE *Kidde* WAY!

Overworked or overloaded motors in your plant—even the smallest—can be a potential fire hazard. Play safe—keep *Kidde** Portable Extinguishers close at hand!

A *Kidde* Portable discharges dry, clean carbon dioxide (CO_2) that can quickly put out electrical fires—without damaging the insulation or corroding metal parts. Since CO_2 is non-conducting, a *Kidde* Portable is safe to use even if circuits are live.

Sizes range from 2½ to 25 pounds CO_2 capacity—a size for every need in portables. All *Kidde* Portables have fast-acting, easy-to-use TRIGGER-FINGER CONTROL. Ask a Kidde representative for full details.

*Also sold under the name "LUX."

WALTER KIDDE & COMPANY, INC. 432 MAIN STREET, BELLEVILLE 9, N. J.

The words "Kidde" and "Lux" and the Kidde seal are trade-marks of Walter Kidde & Company, Inc.

FIRE EXTINGUISHING EQUIPMENT
FIRE DETECTION DEVICES
HIGH-PRESSURE CONTAINERS

Kidde
MANUFACTURING ENGINEERS

VALVES, CYLINDERS, SPHERES
TEXTILE MACHINERY
AVIATION SAFETY DEVICES

McDANEL
High Temperature COMBUSTION TUBES

for use in Metallurgical Laboratories

OTHER McDANEL PRODUCTS

High Temperature Combustion Tubes.

•

Self-cooling Combustion Tubes.

•

Refractory Porcelain Specialties in stock or designed to meet specific needs.

McDanel Combustion Tubes are precision made under rigid laboratory control to assure proper density, accurate bore size, wall thickness, etc. They have a low coefficient of expansion and maximum resistance to thermal shock and abrasion. Now giving outstanding service in metallurgical laboratories throughout the country.

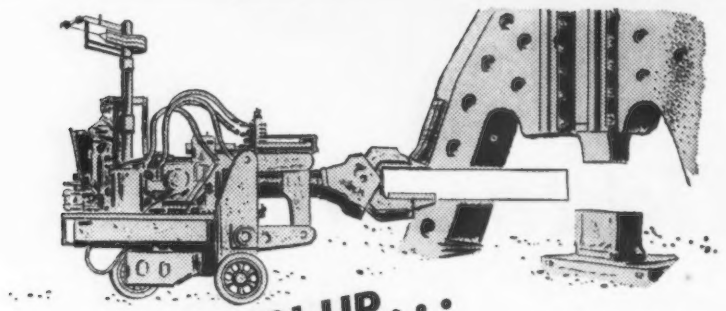
McDanel Combustion Tubes are carefully ground for stopper thickness.

Straight, tapered or double reduced self-cooling ends.

Write for catalog

Specify McDanel High Temperature Combustion Tubes from your supplier.

McDanel Refractory Porcelain Co.
Beaver Falls · · · Penna.



PRODUCTION UP . . .

COSTS DOWN . . .

If its more production at less cost you're looking for consult us about Brosius Auto Floor Manipulators—dual purpose machines for manipulating forging blanks under hammers and presses and the charging and drawing of heating furnaces.

We also design and manufacture Charging Machines, Goggle Valves, Clay Guns, Cinder Notch Stoppers, Dry Slag Granulating Mills, Flue Dust Conditioners, Coke Testing Tumbling Barrels, Soaking Pit Cover Carriages, Clam Shell Buckets and Automatic Dump Buckets.

Edgar E. BROSIUS Company Inc.
Designers & Manufacturers of Special Equipment for Blast Furnaces & Steel Mills
SHARPSBURG, Pittsburgh (15) PENNSYLVANIA

PERSONALS

He will direct the company's reorganized steel sales staff.

• **Y. F. Hardcastle,** vice-president in charge of manufacturing, has been elected a board member of Pennsylvania Salt Mfg. Co., Philadelphia.

• **George E. Grimshaw,** manager, industrial insulation department, Johns-Manville Corp., New York, will retire from the company on Apr. 1 to establish himself as consultant on industrial insulation.

• **Fred R. Cooper** has succeeded **William A. MacDonald** as vice-president of sales for Kaiser-Frazer Corp., Detroit. **Walter P. deMartini** has been named director of sales, and **W. G. Morrison** has been named assistant director of sales. Mr. Cooper was previously associated with Chrysler and Willys-Overland. Mr. MacDonald will continue as a director of Kaiser-Frazer and a member of Mr. Kaiser's executive staff.

• **R. Heath Larry** has been appointed a general attorney of U. S. Steel Corp. of Delaware, Pittsburgh. **Frank L. Wiegand, Jr.** has been elected secretary and general attorney of National Tube Co., succeeding Mr. Larry. Mr. Larry joined National Tube in 1938 and was elected secretary in 1944. Mr. Wiegand comes to Pittsburgh from Dallas, where he has been secretary and general attorney of Oil Well Supply Co., another U. S. Steel subsidiary, since 1945. He started with Oil Well as an attorney in 1942.

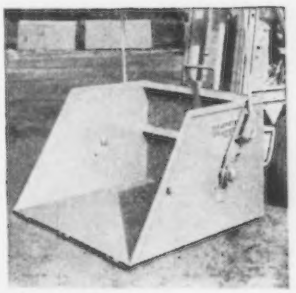
• **L. A. Young, Jr.** has been elected president, and **N. H. Wiesler** has been named executive vice-president of Bowen Products Corp., Ecorse, Mich. Mr. Young was previously associated with Lockheed Aircraft Corp. and Pioneer Plastic Corp.

• **J. H. Dowling** has been appointed general manager of Follansbee Metal Warehouses, a division of Follansbee Steel Corp. He has been with the Wheeling Corrugating Co. for the past 20 years, and comes to Pittsburgh from their Long Island City, N. Y. warehouses.

• **Orno B. Roberts,** manager of B. F. Goodrich Co.'s industrial products sales division's Chicago district for the last 14 years, has retired and is succeeded by **John S. Gulledge,** manager of the Cincinnati district for the last year. **George W. Green** has been named manager of manufacturers' sales of industrial products in the Chi-

Mister-
-You've been Waiting for the "DID"

DEMPSTER DUMPSTER



Above skip type body. Below drop bottom body. Note how bottom forms chute for material.

Remarkably versatile and mobile, the new Dempster-Dumpster "DID" provides an efficient and economical intra-plant materials handling system applicable to nearly every industrial operation. With one hoisting unit handling many bodies, this system is ideal for shifting material from point to point in plant and yard operations. On each trip, up to 2500 pounds of material can be picked up and carried inside the plant from yard stockpiles. Ashes or waste can be carried outside, dumped into a bin or truck body not exceeding 94 inches in height.

With the addition of an easily detachable boom extension, which can be elevated to a height of over 21 feet, the "DID" becomes a mobile crane capable of hundreds of tasks such as lifting pipe, scrap, light machinery, steel, etc.

Shown above is the Dempster-Dumpster Type "DID" Tractor Hoisting Unit dumping a tilt-type body. At left top, the tilt-type body is in carrying position, and below Hoisting Unit approaches body to make the pick-up which is accomplished without the driver leaving his seat.

Detachable bodies are made in many designs to suit any need. Photos at right above show, for example, two other standard types. Write today for completely illustrated literature on this remarkable new Dempster development.

DEMPSTER BROTHERS, Inc.

338 DEMPSTER BLDG., KNOXVILLE 17, TENNESSEE

Cut Costly Production Delays with Botwinik's

QUALITY MACHINE TOOLS USED AND REBUILT

Ready for Immediate Delivery

LATHES

1—Lehman 24" x 14' selective gear head Lathe, M.D., sw. over ways 27", dist. betw. cens. 92", 16 spdle. speeds.

PLANERS

Ohio 24" x 24" x 6' Planer, single hed on cross rail.

TURRET LATHES

B. & S. #2 Hand Screw Mach., power feed to turret, turns any length to 6" hole thru longest regular feeding finger 1"—thru spindle 1-9/16", spdle. speeds 580-2485 RPM, latest type.

MILLERS

Cin. #5-60 Duplex Tracer-controlled Hyd. Miller, tbl. wkg. surf. 20" x 78½" cross range left hand quill 8", right hand quill 8"; vert. movement of spindle, tracer or manual control 13¼".

1—Cin. 28" x 60" Vert. Hydro-Tel Milling Machine, very latest type, tbl. wkg. surf. 28" x 83"; range: long. 60", cross 24", vert. trav. of spin. hed. 14"; power rapid trav.

1—Cin. #5 Plain Hor. Mill. Mach., rect. overarm High Power Miller, tbl. wkg. surf. 79" x 21" power long. feed 50", cross 14", vert. 21".

B. & S. #2B Hor. Miller, long. feed 28", cross 10", vert. 18½", tbl. wkg. surf. 51¾" x 11-11/16"; spdle. speeds 30-1200 RPM, late type.

PRESSES

1—Farquhar 100 Ton Hyd. Press, daylight 48", stroke 36", approach and return speed 1600' per min., given maximum variation 5 degrees, wght. 44,000 lbs., elec. equip. 440/3/60, condition equal to new.

SHAPERS

Fellows #61A Gear Shaper (Rebuilt in 1945) motor in base; will cut external gears 5" face ¾ D.P., 18"; internal gears 3" face ¾ D.P., 18".

HAMMERS

1—United 3000 lb. board drop type.

GRINDERS

Blanchard #11 Roty. Vert. Surf. Grinder; range 20" diam. x 8" high, 16" chuck, 1200 RPM, very latest type, used less than 3 mos.

MISCELLANEOUS

1—P. & W. #BL Model 2416, Keller Duplicating Machine, tbl. wkg. surf. 42" x 22", tbl. trav. horiz. 24", vert. 16", trans. 8"—very late type—3 dimension complete with angle plates control cabinet.

Write, wire or phone for complete listings of our huge stock.

Botwinik Brothers

OF MASS., INC.

5 SHERMAN ST., WORCESTER 1, MASS.

PERSONALS

cago district. **Ernest E. Haupt** succeeds Mr. Gulledge as Cincinnati district manager. **Robert T. Kain,** manager of the industrial products district office in San Francisco for the last 2 years, has been transferred to Dallas as manager of that district. He succeeds **David R. Anderson,** assigned to special sales duties. **Harland B. Lane** has been named manager of the San Francisco district. Mr. Haupt has been with B. F. Goodrich since 1914 in industrial products sales for the last 30 years and salesman in Cleveland for 8 years before his latest appointment. Mr. Lane has been with the organization 20 years, all in industrial products sales in the San Francisco district.

● **Charles S. Conrad, Jr.** has been appointed chief architect of the Armstrong Cork Co., Lancaster, Pa. Mr. Conrad, for the past 5 years assistant chief architect, fills the vacancy created by the retirement of **Henry Boettcher,** formerly chief architect, after 40 years' service with the company. The position of assistant chief architect will be filled by **Floyd S. Kline** who joined the company in 1943.

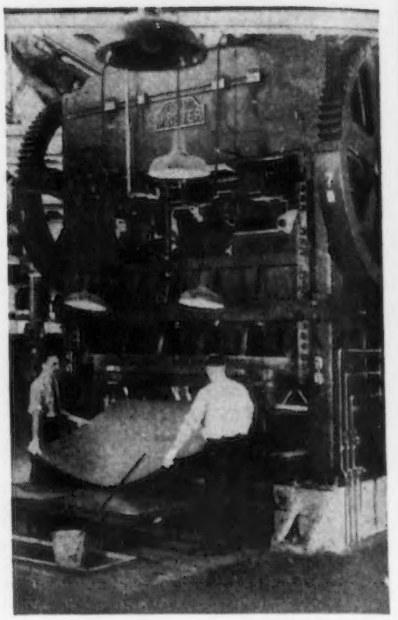
● **Albert J. Fischer** has been named to head the product research and development laboratory of Adamas Carbide Corp., Long Island City, N. Y. He was formerly connected with the carbide division of Firth-Sterling.

● **Alfred B. Meeg,** formerly Milwaukee branch manager for the Iron Fireman Mfg. Co., has been appointed manager of the industrial controls division of Perfex Corp., Milwaukee. **Allen A. Putt** has been made eastern sales representative for Perfex in the controls division. He formerly was manager of commercial sales for the Friez Instrument Div. of Bendix Aviation Corp.

● **L. E. Hilsabeck** has been appointed superintendent, car department, Chicago Great Western Ry. Co., with his headquarters at Oelwein, Iowa. He succeeds **G. P. Hoffman,** who has resigned.

● **Joseph Erdmann** has been placed in charge of all industrial precision castings produced in the New York and Chicago plants of Austenal Laboratories, Inc., microcast division. He joined Austenal in 1932 and has served in various capacities in the management set-up.

IS YOUR PRESS WORK *Strenuous?*



STRENES METAL cast dies are the right tools for severe drawing and forming jobs—large stampings like airplane propeller blades . . . heavy stampings like wheel rims and tractor seats.

The users of ***STRENES METAL*** dies include manufacturers of appliances, airplane parts, automobiles, trucks, tractors, burial caskets and vaults, implements, blowers, etc. Since many of the stampings are extremely large, ***STRENES METAL*** dies frequently weigh in excess of 10,000 lbs.—sometimes as much as 25 tons.

Whatever your drawing and forming problems may be, put them up to us. It will pay you.

THE ADVANCE FOUNDRY CO.

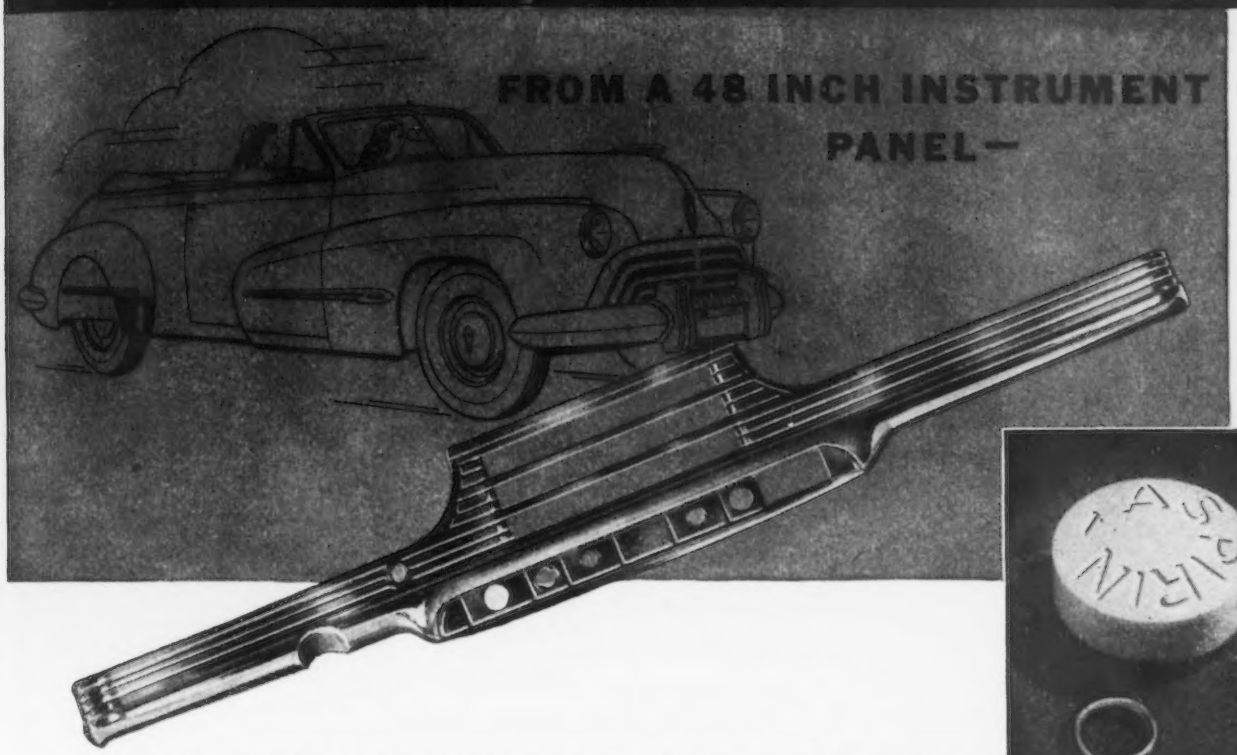
100 SEMINARY AVENUE

DAYTON 3, OHIO

***Strenes* METAL**

FOR DRAWING AND FORMING DIES

Why are ZINC DIE CASTINGS THE MOST WIDELY USED?



The die cast ring is compared with an aspirin tablet as an indication of relative size.

TO A RING WEIGHING .0346 GRAMS!

Zinc die castings offer the design engineer a wider range of size and shape than die castings of any other metal. As an indication of this size range, consider the two zinc die castings pictured here. One is an instrument panel grille from a current model car and the other is a tiny ring which is die cast in the millions.

The grille is 48 in. long and is 7 in. high at the center. It is not only complex in shape, with accurately cored holes and recesses for assembly of control knobs, ignition lock, ash receiver and radio speaker, but is only 1/16 in. thick at most points—except at assembly bosses, ribs and bars. The ring measures 3/16 in. O.D. (less than half the size of an aspirin tablet) and weighs just .0346 grams —13,110 rings to the pound!

Versatility of size and shape is just one of the many desirable characteristics which have made *zinc* die castings the most widely used for many years.

You probably know the zinc die casting alloys by the trade name, Zamak. The New Jersey Zinc Company developed alloys of specific compositions for the die casting industry and gave them this name. Zinc alloys of these compositions are the only ones used for die casting. The die casting industry understands the necessity for careful control in the formulation of these alloys to assure maximum mechanical properties and dimensional stability.

ZINC
FOR DIE CASTING ALLOYS

THE NEW JERSEY ZINC COMPANY, 160 Front St., New York 7, N. Y.

The Research was done, the Alloys were developed, and most Die Castings are based on
HORSE HEAD SPECIAL (99.99 + % Uniform Quality) ZINC

Precision Quality!

Immediate Shipment

GORDON THERMOCOUPLE EXTENSION LEAD WIRE

There are two good reasons why we stress Gordon Quality and Gordon Service. (1) The precision quality of Gordon Thermocouple Extension Lead Wire is based upon 32 years of experience in careful selection and inspection to meet rigid insulation requirements. (2) Gordon's Chicago and Cleveland plants carry complete stocks of Thermocouple Extension Lead Wire for practically every application. (See illustrations below.) This means that your order gets immediate delivery of a QUALITY product—one that meets Bureau of Standards Specifications. ORDER NOW! No waiting or delay. Prices available upon request.

CHROMEL-ALUMEL, Cat. No. 1231(3-A), 14 ga., STRANDED-DUPLEX, each wire felted asbestos, Asbestos-yarn braid overall.

FOR PLATINUM THERMOCOUPLES, Cat. No. 1225, 16 ga., STRANDED-DUPLEX, each wire felted asbestos, Asbestos-yarn braid overall.

CHROMEL-ALUMEL, Cat. No. 1234, 14 ga., SOLID-DUPLEX, each wire enamel, felted asbestos, Asbestos-yarn braid overall.

IRON-CONSTANTAN, Cat. No. 1236-C, 14 ga., STRANDED-DUPLEX, each wire felted asbestos, Asbestos-yarn braid overall.

COPPER-CONSTANTAN, Cat. No. 1235-A, 14 ga., SOLID-DUPLEX, each wire cotton, rubber, weatherproof braid, lead sheath overall.

GORDON SERVICE

CLAUD S. GORDON CO.

Specialists for 32 Years in the Heat Treating and Temperature Control Field

Dept. 16 • 3000 South Wallace St., Chicago 16, Ill.
Dept. 16 • 7L16 Euclid Avenue • Cleveland 3, Ohio

PERSONALS

● **Edward Quekels,** associated with the Bear Mfg. Co. of Rock Island, Ill., for 20 years, and sales manager for the last 15 years, has been named director of a newly-created product development and service department. **Walter V. Hall,** who joined the Bear Co. as a market specialist a year ago, will take over sales of automotive alignment and industrial balancing equipment.

● **Paul E. Lunquist** has joined the Thomas Machine Mfg. Co. of Pittsburgh as sales engineer and special field representative. Prior to joining the Thomas Machine Co. staff, he was associated with Chicago Bridge & Iron Co.

● **Gerard J. Carney** has been appointed sales manager of the special products division of Lodge & Shipley Co., Cincinnati. Mr. Carney joined the Procter & Gamble Co. as industrial sales representative for Southern California following the war and he was then promoted to assistant sales manager of the industrial sales department and moved to Cincinnati.

● **Roy T. Hurley** has been added to the manufacturing staff of Ford Motor Co., Dearborn, Mich. Mr. Hurley was formerly vice-president in charge of manufacturing at the Bendix Aviation Corp.

● **Howard S. Davies** has been transferred from the Baltimore office of Jeffrey Mfg. Co. to Chicago as district manager, conveyer division. **H. C. Rockwell,** formerly of the Columbus, Ohio, district office, is replacing Mr. Davies as district manager of the Baltimore office. **Paul M. Hendry** succeeds Mr. Rockwell at Columbus. **William K. Myers,** formerly of the New York office, succeeds the late **B. L. Lewis** as district manager of the Boston office. **H. A. Lee,** of the St. Louis office, has been appointed district manager of that office, replacing **F. L. Kolb,** who is being transferred to the Chicago office as district manager, mining division. Sales engineers transferred from the home office in Columbus to various district offices are: **Earl J. Woltz** to Harlan, Ky.; **J. R. Brisley,** to Philadelphia; **Norman S. Bell, Jr.,** to New York; and **William T. Davis,** to Houston. **J. W. St. John** is being transferred from the Pittsburgh office to the Cleveland office.

Introducing a NEW Oakite Emulsifiable Solvent Cleaner

use it to
clean metal for pre-paint treatments

use it to
clean and degrease metals for machining

use it to
prepare metals for electrocleaning

Oakite Composition No. 97, the new emulsifiable solvent cleaner, is specially designed for machine-washing of steel, brass, aluminum, zinc die castings and other metals.

Emulsions of Oakite Composition No. 97 speedily wet and dissolve the gease binders in buffing, drawing, cutting, grinding compounds and shop soils. Its surface-active agents quickly loosen deposits for thorough rinse-away. Used as recommended, solutions of Oakite Composition No. 97 have long life because soils are not held in permanent suspension. Solutions leave film that discourages corrosion. No foam. No fire hazard.

For facts about fitting Oakite Composition No. 97 into your production line, contact the Oakite Technical Service Representative today. No obligation.

OAKITE PRODUCTS, INC.
30H Thames Street, NEW YORK 6, N. Y.
Technical Service Representatives Located in Principal Cities of United States and Canada

OAKITE

Specialized Industrial Cleaning
MATERIALS • METHODS • SERVICE

Chase can supply you

...WITH BRASS, COPPER, BRONZE PRODUCTS FROM STOCK!

WANT prompt delivery of brass and copper sheet, rod, wire, or tube? Or brass and bronze nuts and bolts, copper rivets and burs—a myriad of miscellaneous items? Try your local Chase warehouse.

There are 22 warehouses ready to serve you. Ready to fill your orders immediately, ready to place *big* orders directly with the mill for *prompt delivery!*

It's the easy way to obtain mill products—or almost anything in brass, copper, bronze.

Chase

the Nation's Headquarters for
BRASS & COPPER

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PERSONALS

• **E. P. Cunningham** has been made divisional sales manager of the Detroit office of Clearing Machine Corp. He has been associated with Clearing for 15 years, and for the past 2 years has been the Chicago area sales representative.

• **Thomas W. McCausland,** president, **James Lees,** vice-president, and **N. H. Slonaker,** secretary and treasurer of the Hyde Park Foundry & Machine Co., Hyde Park, Pa., have retired after serving the company continuously for over 50 years. **Charles T. Slonaker,** who has had long experience with the company in engineering and sales, has been elected chairman of the board and president. He will also act as general manager. **E. M. McCausland** has been elected vice-president. He has been active in the roll making end and continues in that field. He will also serve as assistant general manager. **G. E. Clifton,** for many years office manager of the company, has been named secretary and treasurer.

• **Ralph L. Wilcox** has been elected vice-president in charge of industrial sales and engineering for the Gerity-Michigan Corp., Adrian, Mich. **W. Waite Broughton** has been appointed to succeed Mr. Wilcox as Detroit divisional manager for the company.

• **Ray W. Christensen** has been appointed assistant advertising manager, aluminum division, Reynolds Metals Co., Louisville. Mr. Christensen comes to Reynolds from the Girdler Corp. and Tube Turns, Inc., in Louisville, where for the last 3 years he has held the position of assistant advertising manager.

• **Donald C. Jolly** has been appointed manager, order and service department for the Southern Alkali Corp. Mr. Jolly joined the Columbia Chemical Div. of Pittsburgh Plate Glass Co. as a shipping clerk in 1933. Since 1939 he has served as chief clerk, traffic and order department at the Corpus Christi, Tex., plant operated by Southern Alkali Corp., a firm jointly owned by Pittsburgh Plate Glass Co. and American Cyanamid Corp. Mr. Jolly will be located at Pittsburgh.

• **John J. Connors** has been appointed purchasing agent for A. Schrader's Son Div. of Scovill Mfg. Co., Inc., Brooklyn, following the death of **Clarence Wilcox.**

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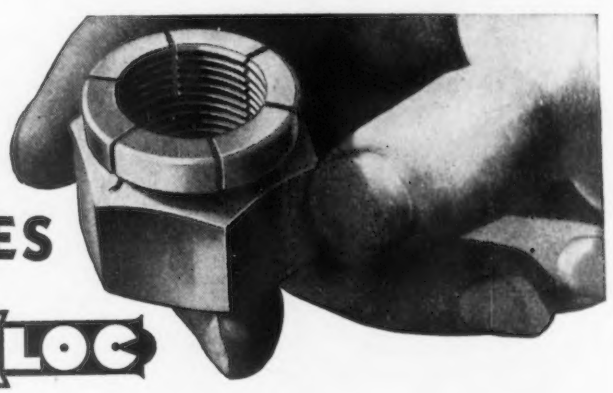

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